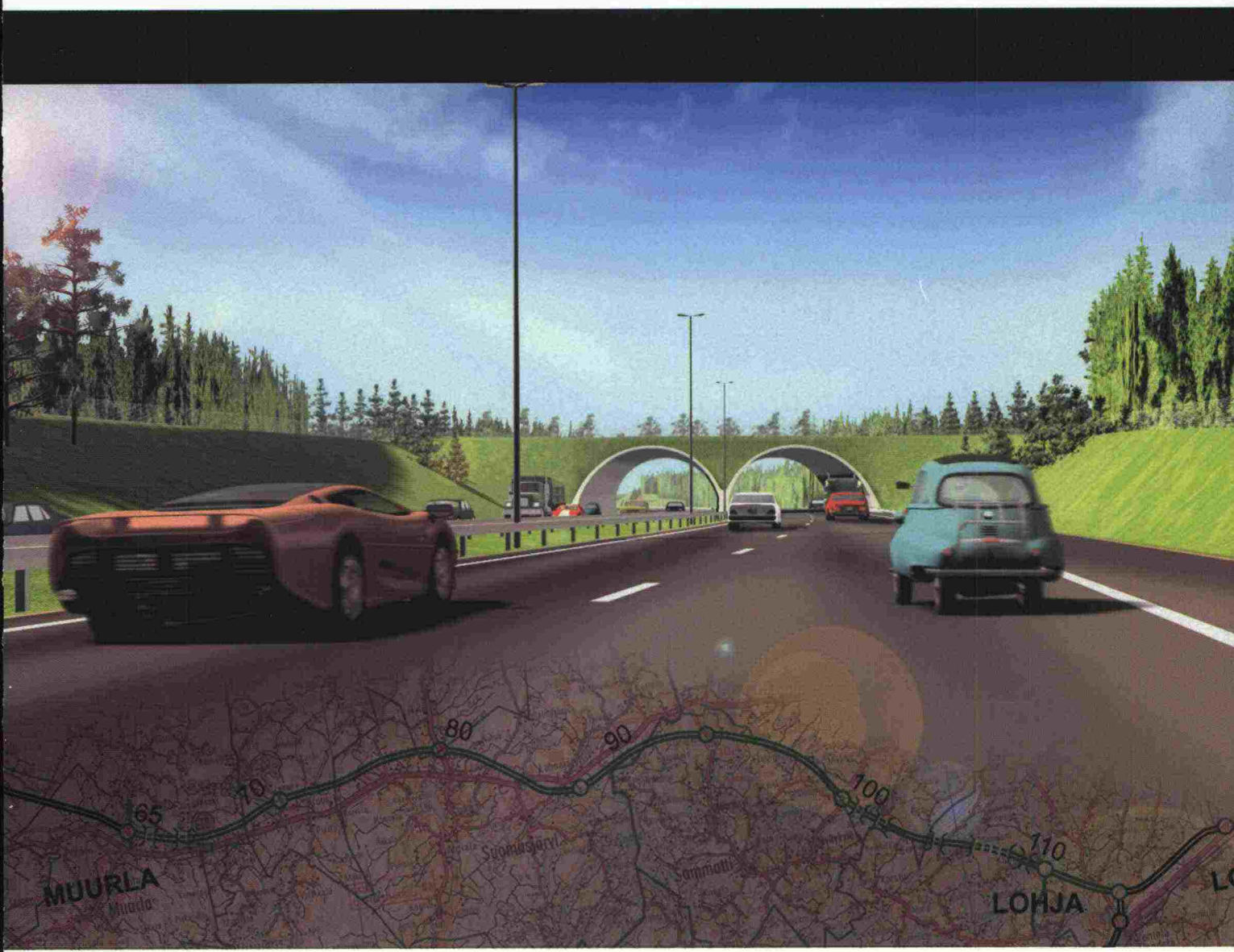
FINNISH ROAD ADMINISTRATION

E18 Muurla - Lohjanharju project

E18 Muurla - Lohja PPP Project
Instructions for prequalification participants

26 March 2004



The purpose of the prequalification material

The prequalification material has only been compiled so that service providers may consider participating in the bidding contest. The information presented in the material may not be used for any other purpose. The prequalification material only presents selected sections of information related to the project.

Finnra reserves the right to change or complement the information presented herein during the procurement procedure, and the information in the brochure may in no way be considered binding in contract negotiations.

This prequalification material has been drafted in Finnish and translated into English. In case of a dispute in interpretation, the Finnish material will be applied.

Bidders selected in the prequalification will be provided with tender documents related to the project for preparation of the actual bid.

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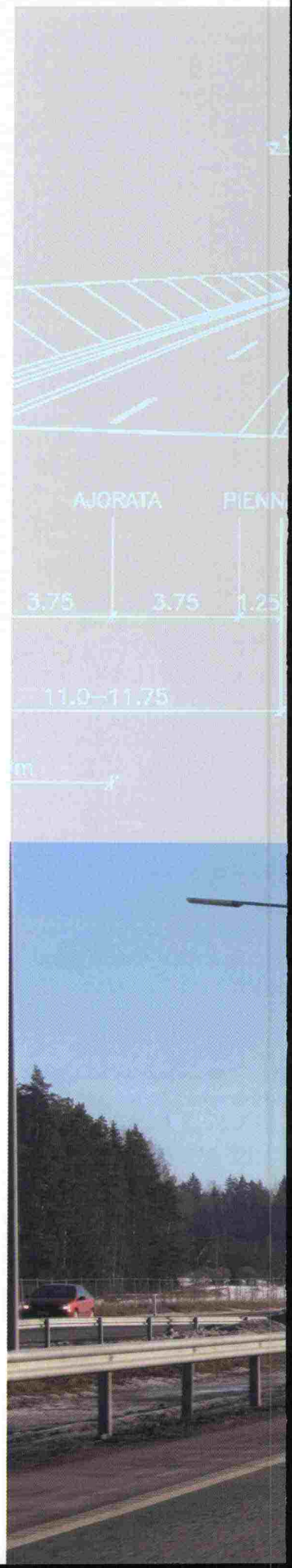


1 INTRODUCTION

European Road E18 is part of the Nordic Triangle, a transport channel prioritised by the EU.

Finnra's (Finnish National Road Administration) E18 Muurla-Lohjanharju project has started a procurement procedure for converting the Muurla – Lohja section of the European Road E18 (highway 1) into a motorway, and for its maintenance with one service contract. The procurement procedure follows the life-cycle model, which is a Finnish application of the Public Private Partnership model (PPP) commonly used internationally. The contract period is 25 years - that is, from autumn 2005 to autumn 2030.

In the first supplementary budget of the State (2004), the proposed order authorisation for the project is EUR 700 million, of which the construction is estimated to account for EUR 335 million. Payments to the contractor will begin at the time the road or a part thereof is opened for traffic. The targeted times of opening the motorway for traffic are as follows:

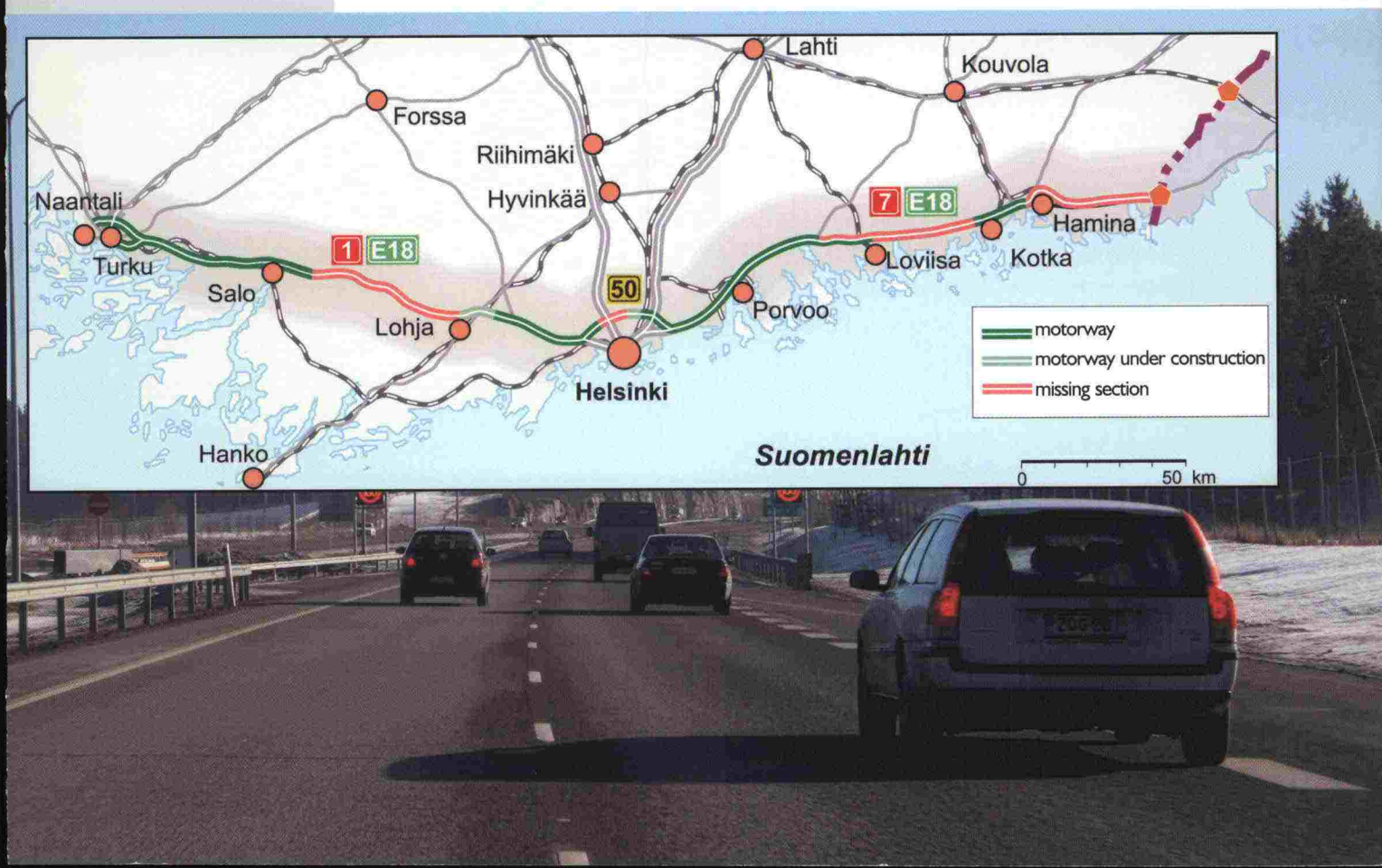
- Muurla – Lahnajärvi section: autumn 2008
- Lahnajärvi – Lohja section: autumn 2009

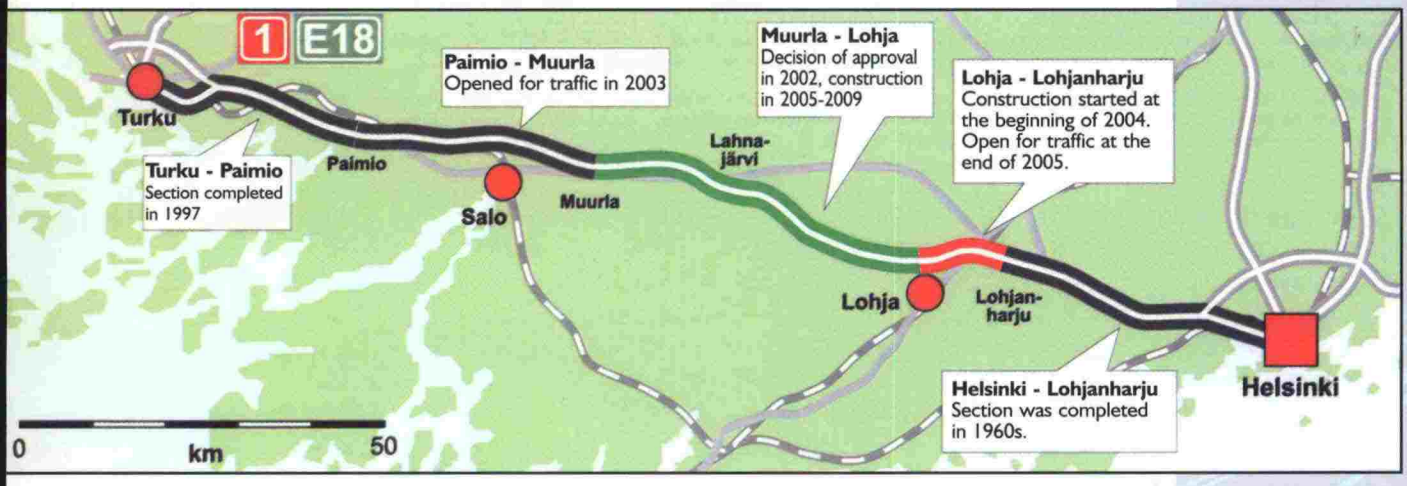
This prequalification material describes the E18 Muurla - Lohja road project and the procurement model, and contains instructions for entering the bidding contest.

1.1 Basic project information

The European Road E18 is part of the Nordic Triangle, a project prioritised by the EU, which, in Finland, passes from Turku and Naantali via the Helsinki Metropolitan Area to Vaalimaa at the Russian border. It links together the urban centres of Finland's southern coastline. Finland's objective is to implement the conversion of the entire European Road E18 to comply with motorway standards by 2015. The map below shows the current situation.

European Road E18 in Finland





European Road E18 between Turku and Helsinki is gradually being developed into a motorway.

Today, the completed sections of the project between Turku and Helsinki are Helsinki – Lohjanharju (38 km) and Muurla – Turku (63 km). The construction of the Lohjanharju – Lohja section (10 km) is underway, and the road will be opened for traffic in the autumn of 2005. The Muurla – Lohja project complements the missing part of the Turku - Helsinki motorway.

The project E18 Muurla – Lohja includes, among other things, construction of 50 km of new motorway, seven motorway tunnels with an aggregate length of 5.1 km, eight interchanges and 49 bridge sites.

The service and maintenance services of the road section include, among other things, the service and maintenance of the motorway and its ramps, tunnels, bridges and other structures, as well as equipment, for a period of 20-22 years.

1.2 Life-cycle model – a Finnish PPP application

The Finnish Government's Ministerial Committee for Economic Policy decided in February 2004 that the procurement model used for the E18 Muurla - Lohja motorway shall be developed with the life-cycle model.

The life-cycle model is a Finnish application of the PPP model (Public Private Partnership), which is based on a partnership between the public and private sectors, and used internationally. In this model the client orders an entity of services from the service provider. The contract signed between the client and the service provider is called a **service contract.**

In the **life-cycle model** the service provider is responsible for the design and engineering for the project, building, its funding and service, and maintenance during the long-term period of contract (DBFO). The client pays service fees. Road tolls will not be applied. The contract period is 25 years - that is, from 2005 to 2030 for the Muurla – Lohja project.

During the period of contract the service provider holds the rights of use and possession for the land prescribed in the project for the implementation of the comprehensive service. After the period of contract the possession of the motorway will be delivered to

the client. The client defines the project primarily as the required service levels, and partly as technical and structural requirements. The service provider agrees to perform all work, measures, material and equipment acquisitions necessary for the completion of the agreed comprehensive service. The obligation to execute the work starts on the date the service contract takes effect. The service provider ensures that the motorway is available for use from the time of opening for traffic to the end of the period of contract.

The use of the life-cycle model enables improved utilisation of the innovations and product development of consultants and constructors, thus improving the productivity and viability of the sector.

1.2.1 Life-cycle model used for obtaining benefits

The introduction of the life-cycle model is aimed to obtain, for example, the following benefits:

Better productivity is achieved when design, construction, service and maintenance form an entity. Overall expenses are optimised when the same actor both constructs the road and maintains it. Therefore, the service and maintenance of the road are better taken into account in the construction.

The client does not specify technical solutions in full beforehand, but primarily specifies the quality of the purchased service. This allows the service provider to exercise innovations in the best possible way, without endangering the quality of the end product. Thus both the client and the service provider obtain benefits.

Customer-oriented service production is obtained through a payment mechanism in which the service provider gets paid for the implemented service. The service fees are tied to the expectations of the road users and society. With the payment mechanism, the quality of services produced is reflected by the size of the service fee. Payment of a higher service fee requires for example savings in road safety or longer structural life. Responsibility for technical quality remains with the service provider, because the service provider is also responsible for the maintenance of the road.

Since the service provider is only paid when the road or a part thereof is open for traffic, the service provider has a financial incentive to optimise the time used for the construction.

Risk management produces cost savings, since risks are allocated to the party who has the best possibilities for managing them. With the conventional procurement procedure, road management risks primarily remain with the client.

Based on international experiences, giving overall responsibility for implementation of a project to the service provider for the duration of a contract brings significant savings to the client.

1.3 The goal is a life-cycle programme

A project based on the life-cycle model requires substantial investments from the service providers. Therefore, creating genuine competition and a functioning market entails the

implementation of several similar life-cycle projects.

Finnra's goal is a so-called life-cycle programme for projects that could be suitable for implementation using the life-cycle model. Decisions on these projects will be made at a later date, case by case, in framework and budget negotiations.

1.4 The authorities, the client and the project organisation

1.4.1 The authorities

Parliament makes decisions on implementing sizable road projects in Finland.

The Ministry of Transport and Communications engages in drafting legislation, as well as resolutions made in Parliament, at the Presidential Session and in the sessions of the Council of State. The ministry also enacts decisions made by Parliament on the maintenance of public roads. Furthermore, the ministry independently drafts decisions and regulations issued in the Statute Book of Finland, as well as provides instructions and stipulations concerning the application of the laws.

The Ministry of Transport and Communications manages the budgetary finances of its administrative sector. The ministry prepares the budget frameworks and the annual budget proposal, and the plan of activities and finances, as well as supervises the use of the appropriations granted for the operating sector of the ministry in the State Budget.

The Finnish Road Administration (Finnra) is a government office operating within the administrative sector of the Ministry of Transport and Communications, responsible for the road keeping/management of public roads. Finnra is responsible for the level of service and quality, the trafficability and the condition of the public road network.

Finnra co-operates with the authorities of other modes of transport in planning, maintaining and developing the entire transport system. Statutory tasks belonging to Finnra as an authority include approval of general plans and road plans, and making road-related decisions. Finnra provides permits, statements and decisions in administrative procedures concerning the extent of the road network and road areas, speed and weight limits, and matters related to special use of the road network, road area and roadsides. Finnra is the expert on the road transport system and prepares decisions related to development of road management, as well as road and traffic conditions for political decision making.

The E18 Muurla – Lohjanharju project is one of Finnra's profit units, with responsibility for, among others, the implementation of the E18 Muurla – Lohja project using the life-cycle model. The E18 Muurla—Lohjanharju project represents the client in this service contract and in contract negotiations.

Finnra's units in the Uusimaa and Turku Road Regions are Finnra's profit units operating as regional authorities. These regional units are responsible for road management in their region.

The E18 Muurla – Lohja project involves the following **municipalities:** Muurla, Pertteli,

Kiikala, Suomusjärvi, Sammatti, Nummi-Pusula and Lohja.

The municipalities are autonomous regional units, responsible for tasks they have undertaken independently and been assigned separately by the State. Such specific tasks related to road management are, among others, issues concerning permits related to the environment and construction. The municipalities are also responsible for detailed planning of land use in their area. The municipalities affect road projects through a statement procedure.

1.4.2 The client's project organisation

In order to implement the project, Finnra has established a separate project organisation, the E18 Muurla—Lohjanharju project, which acts as the client in this project. At the point at which transition to the maintenance phase is made, the role of the client is transferred to Finnra's regional offices.

The client's Project Manager is Matti Vehviläinen, assisted by Juha Sillanpää as the Project Secretary. Their contact information is on the back cover.

In matters of a legal, financial and technical nature, the client will consult experts. The experts' qualification process is ongoing and those appointed will be named in the documents connected with the invitation to tender.

1.5 Finnra's procurement strategy

The objective of Finnra's procurement strategy for road management, approved in 2003, is to develop and introduce such procurement procedures and methods that enhance the utilisation of the innovations and product development of the consultants and contractors. The objective of the procurement strategy is to improve the productivity and viability of operations.

Finnra's role as an orderer of road management services will become clearer. More extensive competence and expertise is required, both from Finnra as the client and the service providers.

Finnra will gradually move toward procurement of overall services that include more extensive, longer-term entities and advance the innovativeness of contractors and consultants. The possibilities of service providers to have a say in the technical implementation of the projects is to be increased, for example by developing requirements concerning functionality.

Overall contracts containing consecutive implementation phases are being developed alongside separate contract and consulting contracts. The procure≤ ment model based on the principle of life-cycle responsibility will strive for cost effectiveness by allocating the risks related to the implementation of the project between the client and the service provider, and by combining design, implementation and maintenance in the project's economic life cycle.

1.6 The bidding process and concluding the contract

The law on public procurements (1505/1992) and the statute on goods and service procurement and construction contracts that exceed a threshold value (380/1998) are applied to procurements made by Finnra as a client authority. The laws mentioned are applied to the procurement procedure.

A procurement announcement for the project was submitted on 6 March 2004, and was published in the Public Procurement Gazette on 11 March 2004, issue 11/2004, and the Official Journal of the European Union (OJEU), issue S47/2004. These instructions for the prequalification candidates supplement the published procurement announcement.

In submitting the project to bidding, a negotiated procedure that begins with a prequalification phase will be used.

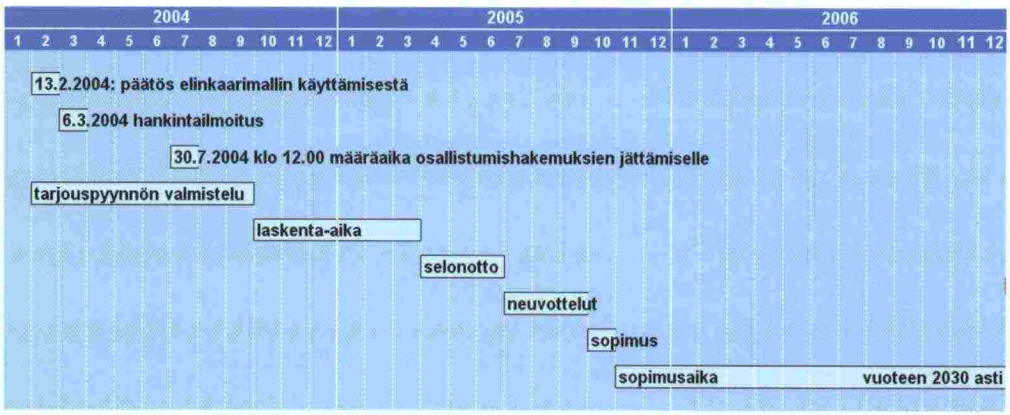
In the prequalification phase the candidates have the opportunity to acquaint themselves with the project, and the procurement model, in order to consider participating in the actual bidding process. The candidates participating in the prequalification are requested to submit the material specified in Appendix 1 in conjunction with registration.

During the prequalification phase the client will select no more than five service providers from the candidates that signed up in an appropriate manner, who will then participate in the bidding contest. The client reserves the right not to initiate a bidding contest after the prequalification phase.

The following phases of the bidding process are:
- registering as a candidate in the bidding contest (by 30 July 2004 at 12:00 noon)
- the phase of calculating the bids
- the negotiation phase
- the contract phase

The objective is to achieve a contract in the autumn of 2005.

Further instructions for the candidates are presented under Item 5.



Phases of the bidding process

2 PROJECT DESCRIPTION

2.1 The purpose of the project and reasons for its implementation

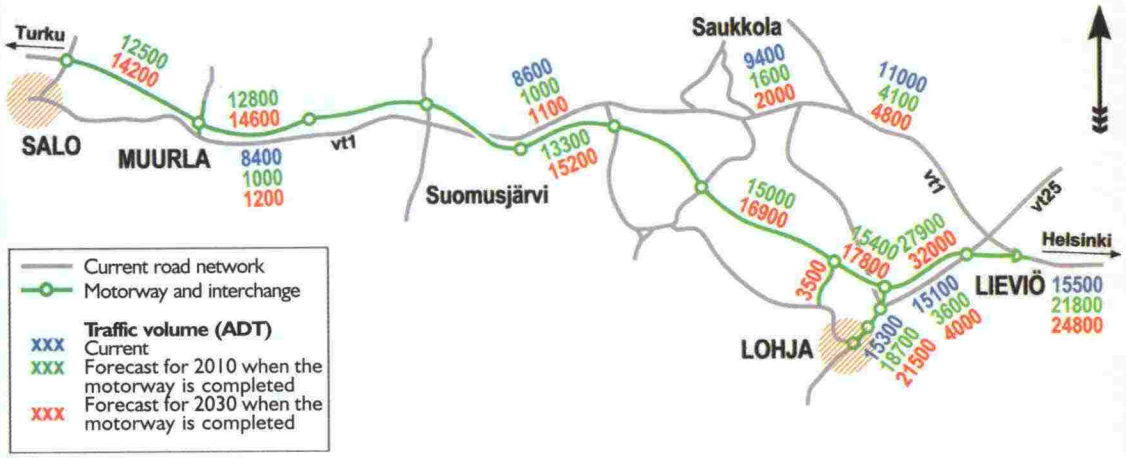
The European Road E18 (Highway 1) from Muurla to Lohjanharju is currently a two-lane highway where traffic safety and the smoothness of traffic are at an extremely low level. The road is narrow, curved and hilly, and has numerous junctions that weaken the security of industrial transportation. With increased traffic the problems will grow worse. The motorway between Muurla and Lohja completes the missing part of the motorway between Turku and Helsinki.

The implementation of the project
-ensures a sufficient and uniform level of service on Finland's most important international connection, which also serves the fastest developing areas of Finland and mass transportation;

- ensures the development of the growth centres in the whole of south-west Finland and Turku, Salo and Lohja, and their connections to the Helsinki Metropolitan Area;
- prevents numerous losses of lives and accidents leading to personal injury;
- reduces noise impact and minimises the risk of contaminating groundwater;
- enables the efficient utilisation of all the benefits of the connection between Turku and Helsinki.

2.2 Traffic volumes and traffic forecasts

In 2000 the traffic volume on the European Road E18 between Muurla and Lohja was 8,400 – 11,000 vehicles per day, of which heavy vehicles accounted for 13-15 per cent. As a consequence of the growth of business in the area, and migration, the increase of the traffic volume on the road has been more intense than the national average. In 2002 the traffic volume was 9,000 – 11,500 cars per day. The forecast for the traffic volume on the new motorway is 14,600 – 17,800 cars per day by 2030.



Traffic volumes in 2000 and the forecast situation in 2010 and 2030 (cars per day).

2.3 Status of the plans

The road plans for the European Road E18 between Muurla and Lohja are based on the following resolutions:

- On 1 November 1990 the Ministry of Transportation and Communications made a project decision stating that preparations will be made for constructing the motorway and included a definition of the terrain passage for which the necessary general plan will be drafted.
- The statutory environmental impact assessment (EIA) was completed in 1996. As a coordination authority, the Uusimaa Environment Centre issued a statement on 3 December 1996 in which it considered, among other things, that the reports submitted were sufficient for comparing the motorway alternative with improvement of the current road network.
- On 3 February 1998 the Ministry of Transportation and Communications made a decision on measures that approved the solutions, compliant with the general plans, for the basis of the further planning of the motorway.

2.3.1 Road plans

The road plans were drafted according to the decision on measures approved by the Ministry of Transportation and Communications, taking into consideration the views presented in the decision and the detailed specifications required in the statement by the Uusimaa Environmental Centre concerning the impact on the environment.

The road plans for the project were drafted in three parts:

1. Muurla – Lahnajärvi (Finnra Road Region of Turku; municipalities of Muurla, Pertteli, Kiikala and Suomusjärvi)
2. Lahnajärvi – Oittila (Finnra Road Region of Uusimaa; municipalities of Sammatti and Nummi-Pusula)
3. Oittila – Lempola (Finnra Road Region of Uusimaa; region of the town of Lohja)

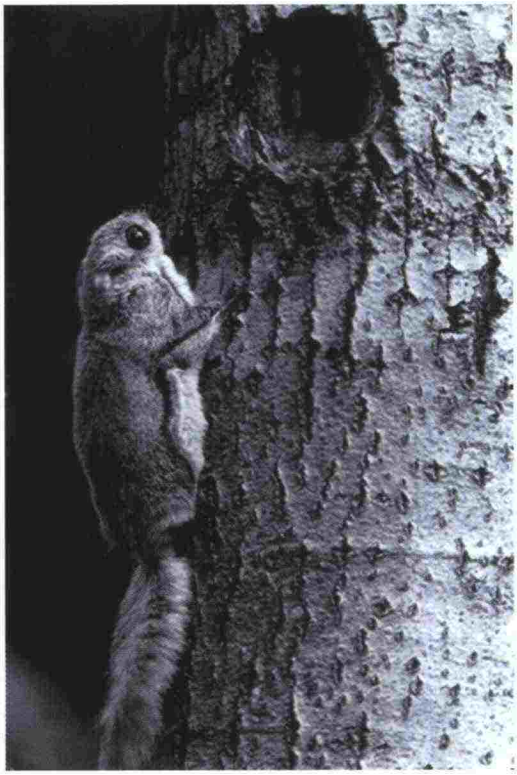
The road plans were completed in October 2001 and have been subjected to the procedure described in the Road Act. The decisions approving the road plans were made by the Ministry of Transportation and Communication in November 2002. An appeal on the decisions was made to the Supreme Administrative Court, which gave its ruling on 31 December 2003. The Supreme Administrative Court dismissed the majority of the appeals, and the road plans are legally valid.

2.3.2 Permit processes

The construction of a motorway requires, in addition to the approval decision provided by the Road Act, certain permits related to the Waters Act, the Act on Environmental Protection, and the Conservation Act. The following chapter describes the different types of permits and their processing phase.

Exemption orders related to the flying squirrel

In 2001 Finnra ordered a report on flying squirrels for the entire road section from Muurla to Lohjanharju. The species is included in Appendix 4A of the EU's nature directive on species requiring particular protection. According to the report, 47 occurrences



Flying squirrel
Pteromys volans
(Photo: Hannu Salonen)

of flying squirrels were located close to the future highway, of which 29 were in the immediate vicinity of the road. After various mitigation measures, it was stated that one site of the flying squirrel's reproduction and resting places would be destroyed by the road and six of them deteriorated. As a consequence, Finnra applied for a total of seven exemption orders from the Environment Centres of the Uusimaa region and south-west Finland. The exemption orders were granted on 20 June 2002. However, appeals were submitted first to the Helsinki Administrative Court and later to the Supreme Administrative Court. The Supreme Administrative Court dismissed the majority of the appeals on 31 December 2003, after which date the exemption orders have been legally valid.

A twig nest of the flying squirrel has been found in the Näpönsuo area of the Raati village of Nummi-Pusula. The new application for an exemption order concerning this finding was submitted to the Environment Centre of the Uusimaa Region in February 2004. The exemption order is expected to be issued at the beginning of the summer. However, appeals may probably be filed. It is, therefore, possible that the commencement of the construction work on this site may be delayed.

Permits compliant with the Waters Act

An application for a permit compliant with the Waters Act (1961/264) has been submitted to the Western Finland Environmental Permit Authority for the cases of the Pernjärvi bridge (permit decision on 28 November 2003 by Western Finland Environmental Permit Authority), the filling of the southern part of Koivulanselkä, the Hossansalmi bridge, the Hossa pedestrian and bicycle bridge, and the Sepänniemensalmi bridge (permit decision on 10 February 2004 by the Western Finland Environmental Permit Authority). These construction sites involve construction in the water system, as defined in Chapter 2 of the Waters Act, and require that a permit be applied for on the basis of Chapter 2, Section 2 of the Waters Act. Part of the environmental permits has been filed for appeal procedure.

Permits for the Lempoonsuo shooting range

The Lempoonsuo shooting range is located in the area of the Lempola interchange. High concentrations of lead were detected in the soil of the area. The contaminated soil has to be repaired and disposed of in the road area. The amount of heavily leaded soil mass to be removed from the road area is 22,000 m^3 and the amount of less contaminated mass is 8,000 m^3. The disposal has required a procedure compliant with the Act on environmental impact assessment (EIA Act 268/94, amendment 267/99). An environmental permit according to the Environment Protection Act (YSL 86/2000) has been applied for and obtained (permit of the Environment Centre of Uusimaa, 8 January 2004). Furthermore, an announcement of the removal of the contaminated soil and cleaning thereof in the road area in compliance with Section 78 of the Environment Protection Act (86/2000) has been made to the Environment Centre of Uusimaa. The repair of the shooting range has been taken into account in the road plan so that the contaminated soil in the road area is removed and disposed of, equipped with protective structures, in the road area inside the ramp loop of the interchange.

2.3.3 Complementing the road plan

The road plans have been drafted primarily for the administrative processing of the plans, and they will be complemented to the level required for the invitations to tender according to the procurement model. The complementing of the road plans was commenced on 15 September 2003 and will be completed on 30 June 2004.

The road plan for the Muurla – Lahnajärvi section in Finnra's Turku Road Region has been drafted to correspond to the conventional level of planning. For the Lahnajärvi – Lohja section in the area of Finnra's Uusimaa Road Region, the road plans were drafted following a simplified procedure. The number of soil and bedrock surveys made in the road plan phase is lower than usual, and the planning of the various types of techniques has not been completed to the level of Finnra's Turku Road Region. The focus in complementing the road plan has thus been on the area of Finnra's Uusimaa Road Region.

The complementing of the road plan has confirmed the basic solution presented in the road plans. This involved extensive, well-documented basic investigations and comparison of alternative solutions. The complementing also includes descriptions of the level of liberty and boundary conditions, and drafts of the background material for applying the life-cycle model. The making of an offer has been facilitated, for example, with thematic maps, including the relevant issues with regard to the implementation.

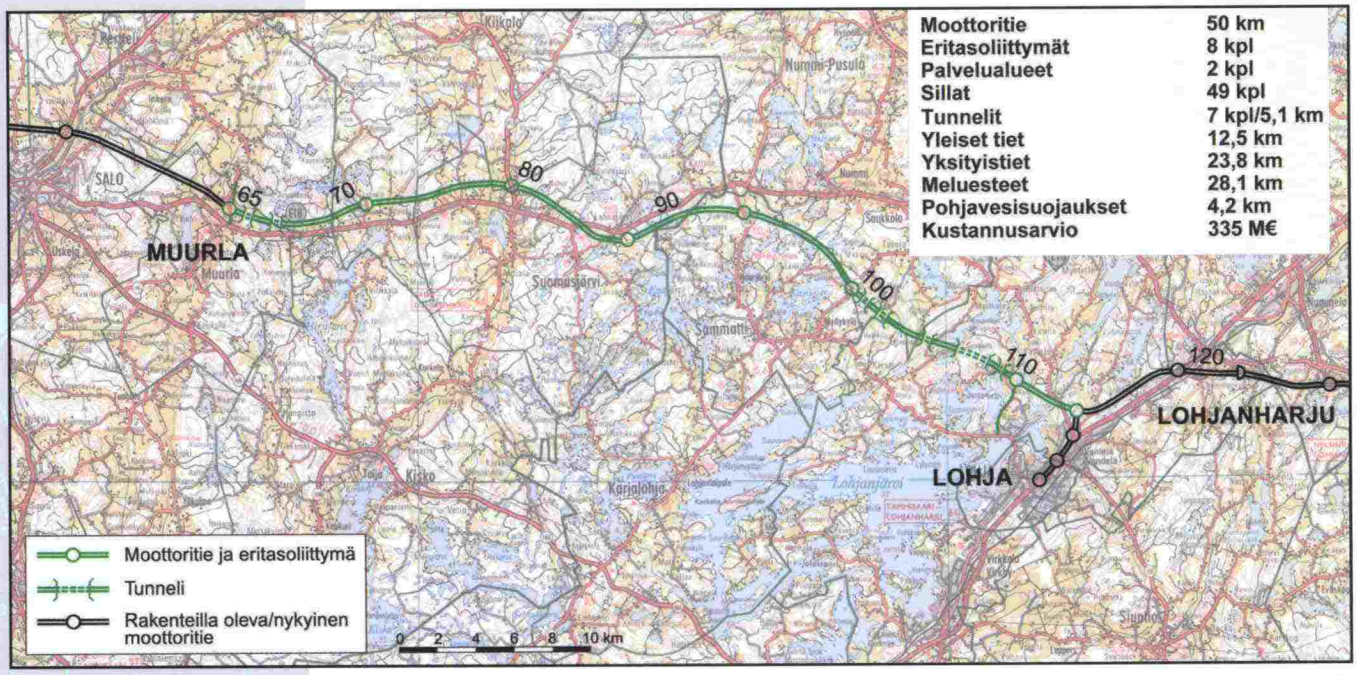
2.4 Project description

2.4.1 General information

The length of the motorway between Muurla and Lohja is approximately 50 kilometres. The project also includes Lohja's western approach road from the interchange of Karnainen to Routio.

The maps and profiles presenting the project are enclosed.

Characteristic of the motorway section are deep rock cuttings and high banks, since the



The project comprises a motorway section of approximately 50 kilometres.

ade separated intersections	8 pcs,
rvice areas	2 pcs,
dges	49 pcs,
nels	7 pcs/5,1 km,
her public roads	12,5 km,
vate roads	23,8 km,
ise barriers	28,1 km,
ound water protections	4,2 km

road runs crosswise with regard to the height sections of the area. There are narrow valleys of field or woods between high rock ridges in the area. Therefore, seven tunnels with an aggregate length of more than 5 kilometres have been planned for this section. Another characteristic of the construction of the project is the exceptionally high amount of excess mass. The processing of this mass is an area of innovation for the service provider. The constructing of the road emphasises the quality of the environment, which shows, in addition to the tunnels, as efficient noise reduction, groundwater protection and several landscape bridges.

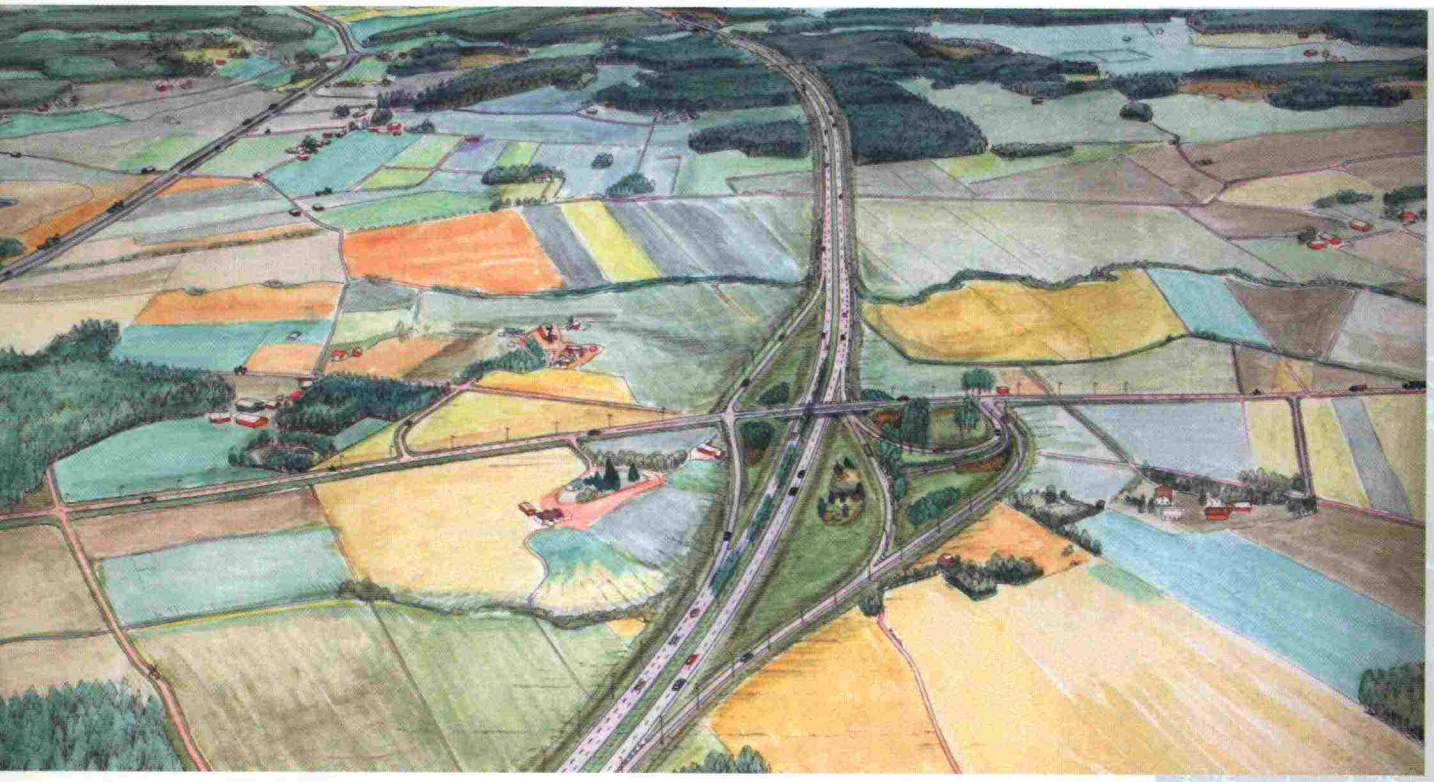
The telematics system of the motorway collects information about the traffic and road conditions. It comprises equipment for monitoring traffic and road conditions and traffic control devices. The system enables the communication of accurate traffic announcements, traffic control and management of possible disturbance situations safely and efficiently. The system must be compatible with the traffic control system introduced in the Turku – Muurla section in 2003.

2.4.2 Roads and junctions

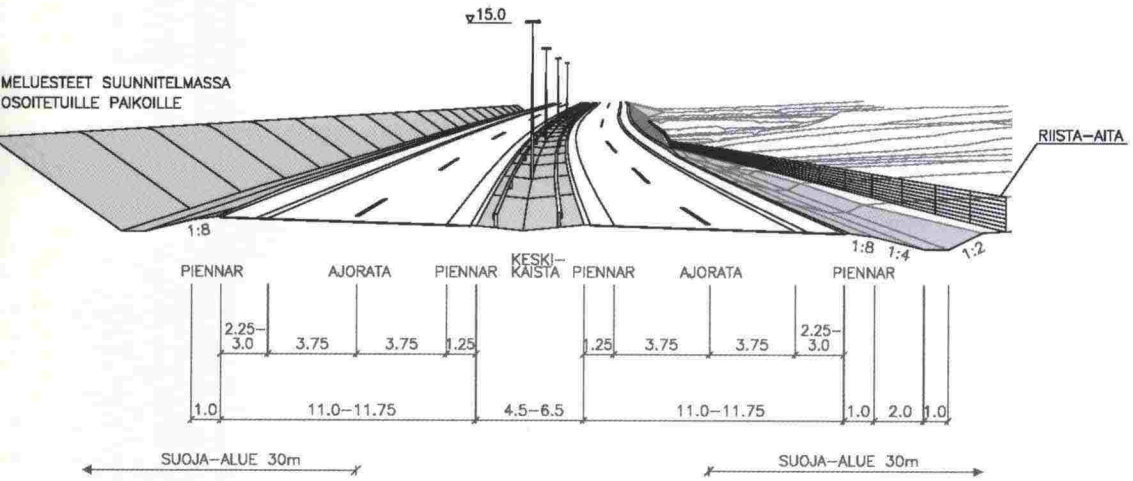
The project comprises the construction of a motorway between Muurla and Lohja as a four-lane dual carriageway, completed with road and junction arrangements.
The motorway will be illuminated in interchange areas and for the Nummi – Lohja section.

The motorway is linked to the existing roads via eight interchanges: E16 Muurla, E17 Kruusila, E18 Suomusjärvi, E19 Lahnajärvi, E20 Sammatti, E21 Nummi, E22 Karnainen and E23 Lempola. Two service areas will be constructed for the motorway: one in Suomusjärvi and the other at Hauklampi in Nummi-Pusula. The new western approach way of Lohja, a two-lane, illuminated road, will be built from the Karnainen interchange to Routio. The length of the road is 2.6 km and its cross section 9/7 metres.

To secure the existing connections, the project will involve arrangements using public and private roads, either parallel with the motorway or across it. Private roads have gravel topping.



Conceptual picture of the Suomusjärvi interchange

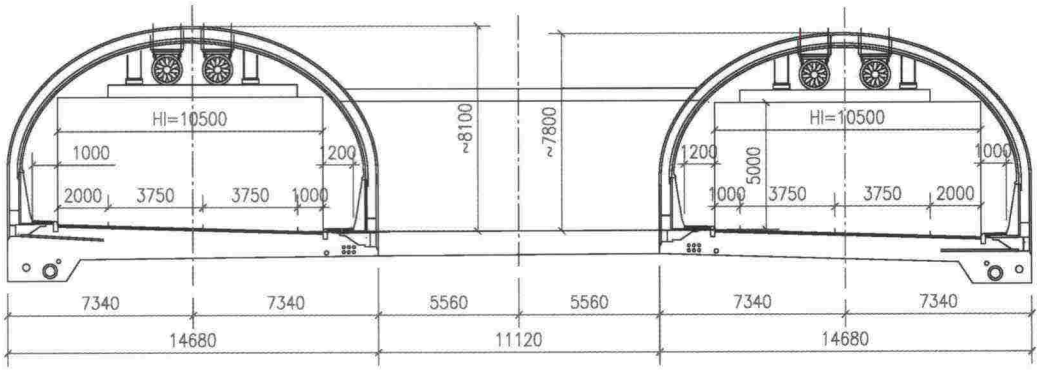


Basic intersection of E18

2.4.3 Tunnels

Owing to the terrain and the environmental aspects, the motorway will comprise seven road tunnels, all of them rock tunnels. The aggregate length of the tunnels is 5.1 km and the longest one is the Karnainen tunnel of 2.2 kilometres. The tunnels avoid the construction of large open cuttings and maintain noise-free green belts over the road.

All motorway tunnels are twin tunnels. The driving tunnels are linked with connecting tunnels, complete with fire and smoke departments. This arrangement eliminates head-on collisions and ensures that people have a short exit route in every situation.

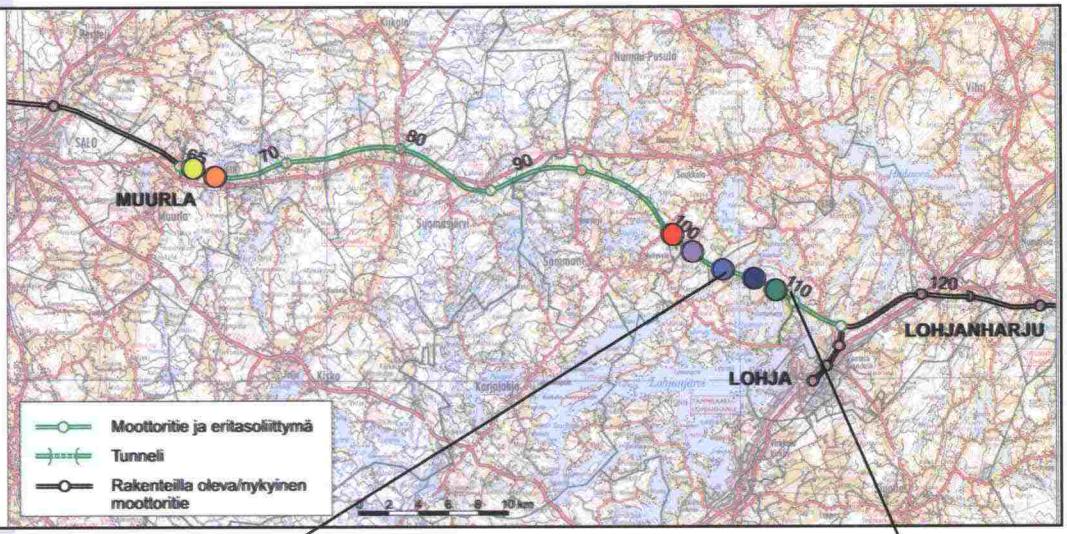


The intersection of the Karnainen tunnel

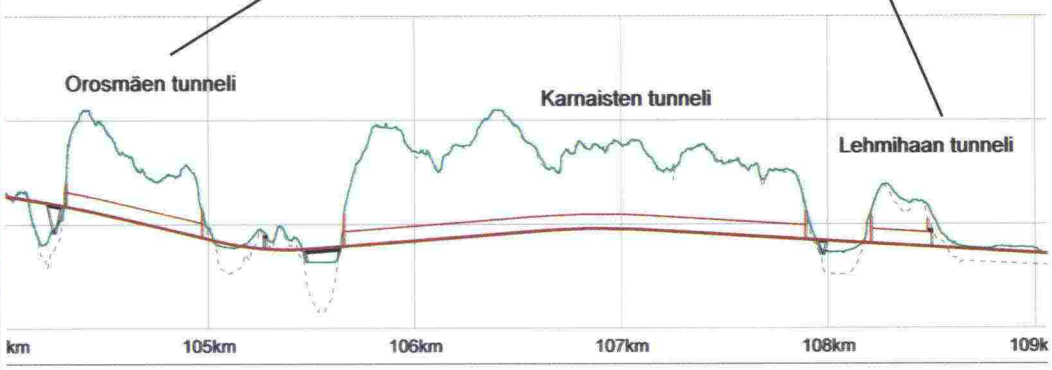
Supervision and traffic control, as well as fire, accident and exceptional situations, are managed with a secured power supply and systems for ventilation, smoke venting, lighting, traffic control, security and monitoring.

The feasibility of construction and environmental impacts have been examined through surveys and monitoring systems, which will be complemented in the further planning phase. The examinations and appropriate planning and construction solutions ensure that the tunnels cause no harm to the surrounding environment and the surfaces of the ponds.

- **Hepomäki 250 m**
- **Lakiamäki 480 m**
- **Tervakorpi 575 m**
- **Pitkämäki 620 m**
- **Orosmäki 645 m**
- **Karnainen 2230 m**
- **Lehmihaka 265 m**



Position of the tunnels in the road section



Orosmäki, Karnainen and Lehmihaka tunnels

2.4.4 Geotechnical engineering

The new motorway is located in a terrain of very steep alterations. Typical of the terrain are minor alterations between rocky hills and moulds between them. The soil in the relatively short moulds between the rocky hills is mostly peat and/or clay.

There are four larger sections of soft soil in the Muurla – Lahnajärvi road. They are located in the area of the Muurla interchange north of the Vähärytkö lake, the valley of the Huitinjoki river and the Varesjoki valley west of the Suomusjärvi interchange. Moreover, there are short, but rather deep, soft soil areas between the rock areas, where replacement of the mass has been proposed to strengthen the foundation. The soft area of the Huitinjoki valley will be crossed with a bridge; embankment piling has been suggested for other, larger soft soil areas. In the Varesjoki valley the basic solutions comprise vertical drainage and lightweight embankments of expanded polystyrene in the groundwater area.

In the Lahnajärvi – Oittila section there are only three longer soft soil areas, located in the area of the Sammatti interchange, the field west of the Nummi interchange, and the Raatinjoki valley. The primary proposed measure for strengthening the foundation in the soft soil areas between the hills is replacement of the mass. Embankment piling has been planned for the very deep soft soil of the Raatinjoki valley.

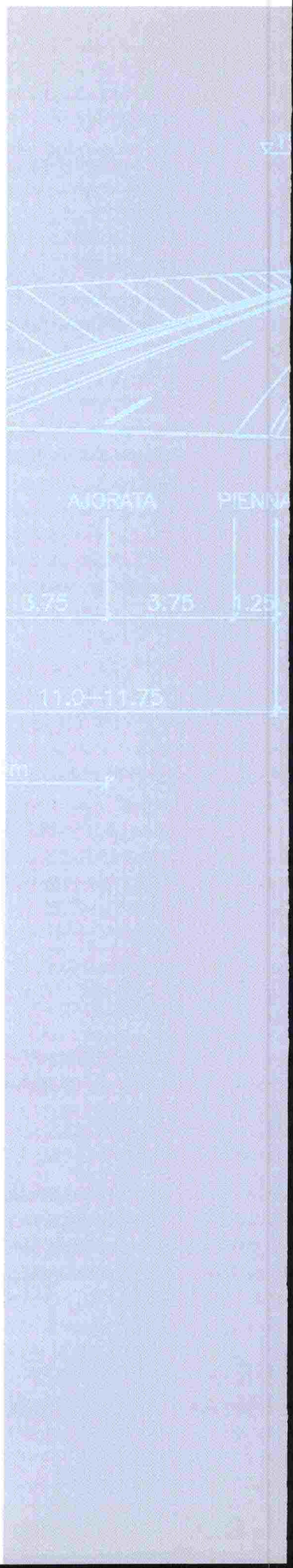
Alteration of large rocky hills, and the peat or clay moulds between them and the water areas, is also typical of the Oittila-Lempola section. For the Oittila-Lempola section, the primary proposed measure for strengthening the soil is replacement of the mass. Stabilisation is the basic solution in areas with thick clay layers where the bank height is suitable for stabilisation. The stability of high noise reduction walls on soft soil has been improved with shredded tire filling in some places. The largest continuous soft soil area is between the Lehmihaka rock tunnel and the Karnainen interchange. In the area of the Karnainen interchange the main road and part of the ramps are located on the Koivulanlahti bay, which has undergone an almost complete paludification and has a layer of clay/mud of 14 metres at its thickest.

2.4.5 Mass economy and heaping areas

Long sections of the road run through deep rock cuttings, and the bank sections between the hilly areas are relatively short. For environmental reasons, landscape bridges have been planned for the longest bank sections. An exceptionally large amount of excess mass will be produced by the project.

The soil and rock mass that can be utilised will be used for the road structures; nevertheless, according to the mass examinations, the amount of excess mass is approximately 5.4 million solid cubic metres. Two-thirds of the excess is the residue from rock and tunnel cutting. On the basis of an engineering geology mapping it has been estimated that the material generated by the process is not suitable as topping rock material for the pavement, and it has been assumed that is to be acquired externally.

In the road planning phase, measures for reducing the excess mass have been examined, taking into account environmental aspects and past negotiations. An essential part of the planning has been the placement of the excess mass in a most economically feasible way within the reach of short transportation.



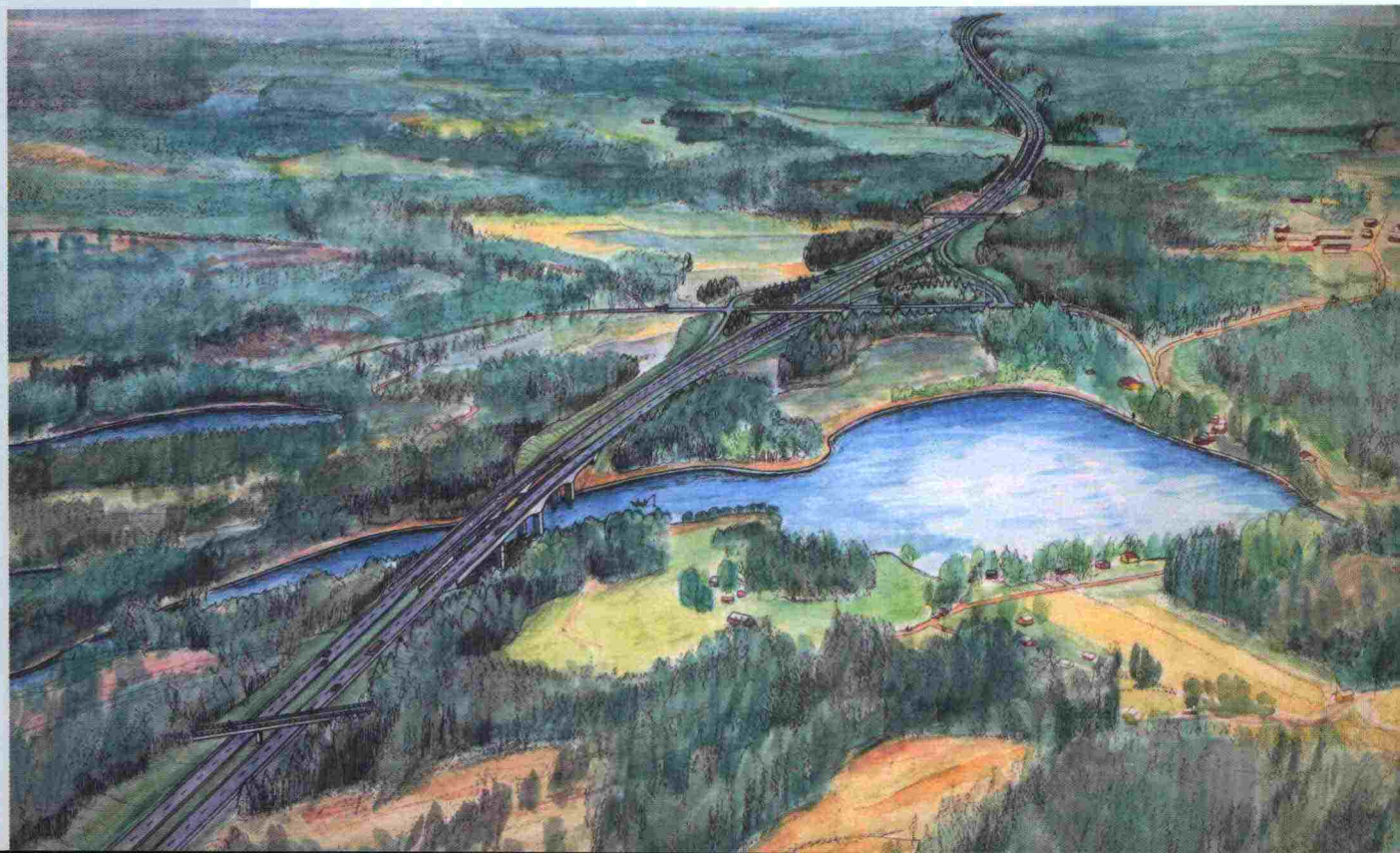
A total of 69 heaping areas for the excess mass will be reserved for the entire road section, as well as four areas for the temporary storage of excess rock waste. For reasons of landscape preservation, the heaping areas have been located close to the motorway. They will be modified following the profile of the existing terrain and integrated with the current ground surface in an imperceptible manner, so that the natural drainage of the terrain will not be prevented. The areas will be landscaped and reforested, as and when necessary, after which they will be assigned to the landowners.

2.4.6 Bridges

The project contains a total of 49 bridge sites, one of which is a so-called green bridge. The effective width of the green bridge is 35 metres and a proposal has been made to implement the bridge as a vaulted bridge made of reinforced concrete. Of the other bridges, eleven are reinforced concrete slab frame bridges, twelve are slab or girder bridges of reinforced concrete, and 25 are prestressed concrete girder bridges. The major bridges of the project are:

- The Huitinjoki valley bridge, approx. 360 metres
- The Pernjärvi waterway bridge, approx. 250 metres
- The Hossansalmi waterway bridge, approx. 180 metres
- The Haijala valley bridge, approx. 180 metres
- The Sepänniemensalmi waterway bridge, approx. 160 metres
- The Raati valley bridge, approx. 140 metres

Conceptual picture of the Pernjärvi Bridge



Conceptual picture of a green bridge

2.4.7 The environment

Road environment and architecture

The objective of the road environment and architecture is subtle and plain modification of the environment. The spirit of the high-quality E18 road architecture and the principles of nature preservation and ecological durability shall be upheld in the implementation. The code colour of the European Road E18 is green combined with blue and white.

Plantations mainly consist of forest seedlings and small-stem wood. Other plants requiring more gardening are to be placed in specific sites. The reforestation favours tree species growing in the surrounding environment; the use of hardwood trees is also justified in areas of cultural landscape and habitats of flying squirrels.

Planting on the noise reduction walls is adjusted to the surrounding environment. In an open landscape the benches will be treated as open, meadow-like areas. In forest areas they will be reforested with forest plants suitable for the surrounding vegetation. In some places, small tree groups of larger seedlings will be planted on the roadside, for example at the ends of the benches.

Natural values

The road runs through important natural areas and changes the natural landscape, as well as areas of cultural landscape. The impact is efficiently alleviated with tunnels, the placing of the road, and landscape and green bridges. Precious natural values have affected several details in the planning of the project, which result in specific features and limitations concerning construction. The central specific features are:

- groundwater protection in the areas of Suomusjärvi and Lempola interchanges;
- individualised alleviation measures and schedule limitations required by the numerous habitats of flying squirrels;
- limitations of construction in waterway sites during the spawning season of fish and

the nesting season of birds;
- purification of surface waters and the controlled channelling of the waters into the water system.

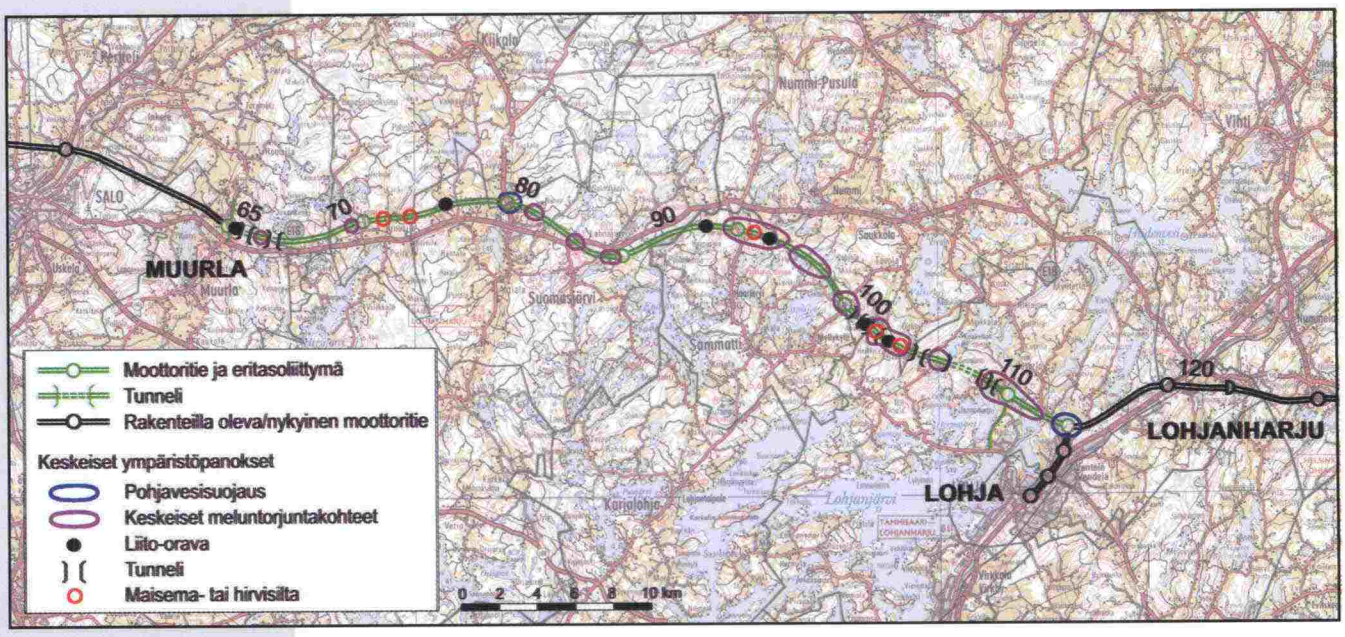
The natural environment of flying squirrels will be protected by conserving as much of the existing woods in their habitats as possible. The nesting trees of flying squirrels located in the area and the vegetation in their immediate vicinity will be preserved. Wherever possible, the surface level of the road has been reduced near the habitats of flying squirrels to facilitate their crossing. Aspens and hardwood trees will mainly be used in the reforestation of these areas. The seedling material must consist of sufficiently tall trees of different sizes.

Noise control

The point of departure for noise control is the decision of the Council of State (Vnp993/92) on the standard values of noise level in the daytime (7 am – 10 pm) and at night (10 pm – 7 am) in residential areas, areas of holiday residence and recreational areas:
- The average noise level (L_{Aeq}) of residential areas in the daytime (7 am – 10 pm) is 55 dB and at night (10 pm – 7 am) 50 dB.
- The average noise level (L_{Aeq}) of holiday residence and recreational areas in the daytime (7 am – 10 pm) is 45 dB and at night (10 pm – 7 am) 40 dB.
- The standard values used for measuring noise controls are daytime noise levels (7 am – 10 pm) that surveys have proven to be determining in their effects.

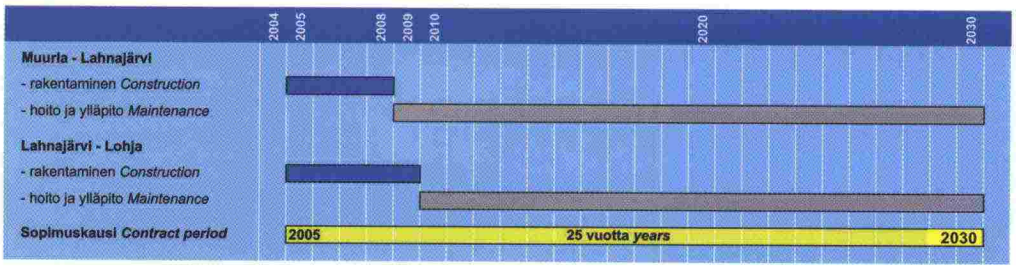
The planned primary measure for noise control is terrain modification. The excess mass can be used to ensure that the level of noise control exceeds the targeted level. At their highest, the noise reduction walls are more than ten metres high. By taking the natural forms of the terrain into account, the benches can be landscaped to look as natural as possible. On sites where the embankment is high, or in areas of geotechnical difficulty, it has been proposed that noise walls and railings be constructed. In order to secure the visibility of the surroundings, at least part of these walls should be transparent.

Central environmental sites



2.5 Service and maintenance period

The purpose of service is to ensure the safe and smooth passage of traffic on the road every day. The maintenance measures will eliminate faults or defects resulting from wearing of structures and equipment, and restore them to the planned condition.



Contract period 2005-2030. Service and maintenance begins in 2008 and 2009 as the road sections are completed.

The service provider's responsibility for service and maintenance starts at the time the road is opened for traffic and continues until the end of the contract period.

The level of service must cover at least the service of road sections limited by the project and must comply with the quality requirements presented in the regional contracts of maintenance. The most expensive task is wintertime service.

Maintenance during the contract period must ensure that the quality of the road area and its structures is a uniform part of the main road network. There must not be an abnormally great need to maintain (repair) the road structures immediately after the contract period has ended. The maintenance section of this project also includes the repaving of roads and road markings.

3 PROCUREMENT MODEL

The purpose of the life-cycle model is to achieve cost savings, make design and construction more efficient, and develop road management objectives in a more user-friendly direction.

3.1 Introduction

The competitive bidding to be organised comprises the construction, service and maintenance of the E18 Muurla – Lohja motorway as a single whole, as a so-called overall service. The service provider assumes overall responsibility for activities defined by the service contract for the period of the contract. The service provider is responsible for design and engineering, constructing and funding the investment, and for the related service and maintenance operations (DBFO) from the date the contract enters into force until the date on which the period of contract ends. The service provider is also responsible for any possible basic repairs during the period of the contract.

The service fee paid by the client includes compensation for the usability of the motorway, as well as the services required for using it. The quality and quantity of the produced services affect the amount of the service fees paid by the client.

The service provider is responsible for any damage and detriment to surrounding real estate, road users and other third parties caused by the design, construction, service and maintenance of the motorway. The client is responsible for the official administrative tasks and road construction proceedings so that the land areas required for the road are available to the service provider.

During the contract period the service provider has the right of use and possession of the road areas only to the extent required to complete the agreed services.

3.2 Contract documents

The contract documents comprise the service contract, contract-specific conditions and appendices. An example of an attachment to the service contract is service description. This refers to documents containing the client's specifications of the quality and quantity of the requested end product. These documents specify the minimum level of quality of the product or service required by the customer, the preconditions for the service producer's quality system, reporting and follow-up, sanctions and other requirements related to planning and technical implementation.

A so-called trilateral contract will be made between the client, the service provider and the financiers - the purpose of which is to ensure that the production of the overall service continues without interruption and the minimum disturbance.

The contract documents will be drafted in Finnish.

3.3 Main content of the service contract

The service contract contains principles concerning the mutual rights, duties and liabilities of the client and the service provider, as well as the principles of balancing risks. The contract defines, among other things, the service provider's obligation to render services, the payment mechanism, the obligation of quality assurance, liability for damages, responsibilities and liabilities related to design and construction, responsibilities and liabilities related to service and maintenance, assistance in performing official tasks, delays, exceptional situations, rules of procedure between the contracting parties, the service fee paid by the client and the invoicing and reporting thereof, changes to the service fee (bonuses, depreciations, sanctions and compensation for damage), the client's right of inspection and right to obtain information, the index clause, and the terms and conditions for terminating and cancelling the contract.

The period of contract begins in the autumn of 2005 and ends in 2030. The service contract specifies the procedure for managing amendments in the contract.

3.4 Performance specifications and technical product requirements

In the life-cycle model the client determines the performance specifications and gives the service provider latitude in producing the services agreed.

Performance (functional) requirements serve to define how the structure is expected to function during use. They are independent of structures and effective for the entire duration of the contract.

Performance requirements are applied, among other things, to the top surface of the road structures, the environmental impact of the service produced, and the fittings and equipment.

Technical product requirements are precise quality requirements for the structures. They are particularly used as requirements for bridges and tunnels.

The requirements set for the end product are specified in detail in the documents included in the invitation to tender.

3.5 Risk allocation

The service contract defines the allocation of risks between the parties.

Risk allocation aims to optimise the expenses caused by the risks. The party in charge of risk management is the one that is better equipped to control the occurrence of risks, the probability of their occurring, and expenses and measures caused by incurred risks. The life-cycle model allocates the risks caused by, for example, official tasks, public administration and political decision making and, to some extent, the risk incurred from increased expenses to the client. The service provider is primarily responsible for other risks related to the services it produces.

Risk allocation is specified in detail in the documents related to the invitation to tender.

3.6 Payment mechanism

The payment mechanism combines the quality and quantity of services produced with the service fee paid by the client. The service provider will only obtain payments for the services from the client when the road to be constructed is opened for traffic. Therefore, the service provider will be paid for the construction with the service fee, only payable after the road has been opened for traffic.

The payment mechanism is presented in more detail in Chapter 4.

3.7 Supervision by the client

The client has ample rights to monitor the activities of the service provider. The service provider is obliged to inform the client not only of its service provision but also of its own financial standing.

The client and the service provider will regularly gather for meetings concerning the contract.

The client is entitled to supervise the service procurement during the construction and maintenance phases not only by means of random checks but also by monitoring the progress of work by working phases, for example through participation in the construction site meetings and by following the construction log and quality reporting.

During the service period, the service provider is obliged to report on events related to the production of the service. According to the principle of the so-called auto-audit, any deviations from the agreed level of quality, for example, must be reported to the client. Services that demonstrate a quantitatively or qualitatively inferior level to that agreed entitle a reduction in the service fee paid to the service producer or must be redone in accordance to the quality or technical standards.

3.8 Quality assurance

The service provider is obliged to ensure that quality assurance is exercised during the period of the contract, including matters related to safety, health and safety at work, and the environment.

3.9 Introduction and acceptance

Prior to the introduction of the constructed road the client will arrange an introduction inspection. The service provider shall prove that the road meets the functionality and technical requirements set at the time it is opened for traffic.

Furthermore, the client will arrange a project acceptance inspection at the end of the period of the contract, after which the right of use and possession of the road is assigned to the client. The service provider should be able to demonstrate the long-term endurance of the structure at the preliminary acceptance inspection, to be arranged 3-5 years before the end of the period of the contract.

4 PAYMENT MECHANISM

4.1 Principles of the payment mechanism

The payment mechanism combines the quality and quantity of services produced with the service fee paid by the client. The requested quantity and quality of services is specified in the service descriptions. The payment mechanism determines how deviations from the requested quantity of services and the level of service affect the compensation obtained by the service provider. The objective is to encourage the service provider towards a high-quality performance. The offer should be priced according to the payment mechanism.

The service provider's capital will be tied in order to produce the services ordered as of the date on which the service contract takes effect. Financing responsibility in the project entails that the service provider is responsible for all costs incurred in the planning and construction, and the production of other services agreed upon, but that the service provider will obtain payment for the services at a much later date. The service fees are used to cover the service provider's expenses related to investments, financing, maintenance, administration and other issues, as well as the profit targeted by the company.

In the figure the blue area describes the bonding of the service provider's assets at the construction phase of the project and the phase of producing maintenance services. Additional costs entered under the phase of producing maintenance services represent the upkeep costs. The yellow area in the figure represents the service fees paid by the

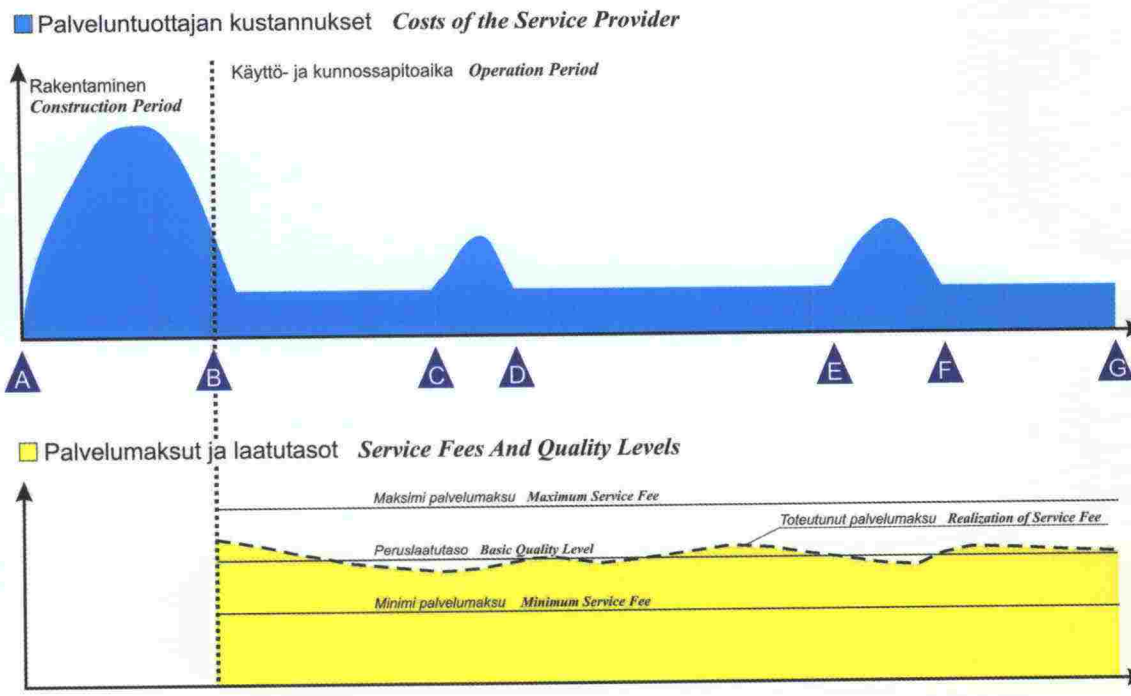


Figure of principle describing the bonding of capital with the investment and service project.

A Coming into effect of the contract
A–B Construction Phase
B Implementation
C-D Maintenance investment
E-F Maintenance investment
G End of the period of the contract

client. In the life-cycle model the company only begins to receive service fees from the client after the road to be constructed has been opened for traffic.

The service fee paid to the service provider is compensation for the availability of the motorway and the services required for using it. The factors affecting the amount of compensation are the quality and quantity of the services provided. Prior to the introduction of the road the client will arrange an introduction inspection. Correspondingly, the client will arrange an inspection for accepting the project at the end of the period of the contract, at which point the rights of use and possession are transferred to the client. The basis of payment will be set according to the objectives of the client. The basis of payment reflects the expectations of the road users and society.

A range of variation for the level of service will be set so that it is possible to determine the price ceiling and, on the other hand, the minimum standard of quality that the client will pay for. The amount of the service fee, within the permitted range of variation, is determined by the realised quality during the payment period. The sensitivity of the payment mechanism is determined so that high quality acts as an incentive and poor quality makes the work unprofitable.

4.2 Structure of the payment mechanism

The service fee is a payment tied to a certain point of time, which will be paid from the date on which the road is opened for traffic to the end of the period of the contract. Owing to the payment mechanism, however, the amount of the service fee will vary, depending, for example, on the fulfilment of the requirements set and traffic volumes, traffic safety, environmental factors, smoothness of traffic and customer satisfaction. The maximum impact of these factors, changing the amount of the service fee, is +/-10 per cent.

The sensitivity of the payment mechanism is adjustable, so that with a routine payment the service producer can cover its fixed and variable expenses. By providing a service exceeding routine performance, the service provider can collect a higher service fee. Correspondingly, failure to achieve the basic or "routine" level will result in reduced service fees. Another factor essential for the client is the price ceiling, referring to the maximum price to be paid for the service.

The successful delivery of the service is measured with three indicators:

4.2.1 Availability

Availability refers to, for example, a situation where the lanes are available and the daily maintenance ensures their availability at all times. The life-cycle model allows for different alternatives for scheduling the investment and maintenance phase (topping layers, preparedness for repair of settlements, equipment types of telematics, etc). The decision regarding the selection of the option, within the requirements set, is made by the service provider. Service and maintenance work also affect the availability of the lane capacity (open lanes, quality of the surface, functionality of traffic-related services).

The road user mainly perceives availability as the condition of the surface as a functioning traffic environment, and the level of road service. What is essential for society is the

availability (trafficability) of the road throughout the year and around the clock in all circumstances, as well as the fact that attention is paid to environmental factors.

Availability defines the basic amount of the service fee, which the portions of performance and durability complement.

4.2.2 Performance

As part of the payment mechanism, performance measures whether or not the service is functioning as requested. For the road user, this is demonstrated as smooth traffic, predictable travel times and possible additional services. From the point of view of society, a good performance means reduced driving expenses, a good level of traffic safety and minimal impact on the environment.

4.2.3 Durability

Durability, as part of the payment mechanism, refers to the long-term duration of the structures after the period of the contract. Several parts of the road structure are designed to last longer than roughly 25 years, which is the duration of the period of the contract. Therefore, a minimum quality, the so-called delivery quality, that the structures must comply with at the end of the period of the contract will be determined. With regard to service, the delivery condition of the structures can also be determined. In this case a separate remuneration can be paid to the service provider in the event that the road is in a condition better than expected at the time of the assignment. The service provider, in turn, is obliged to compensate the client for any possible failure to achieve the agreed delivery standard.

4.3 Other issues

Boundary conditions related to the general development of productivity, changes in the level of expenses and risks, conditions of refunding and force majeure conditions are defined in the contract.

A detailed specification of the payment mechanism is presented in the preliminary service contract included in the tender documents.

5 REGISTERING AS A CANDIDATE, PREQUALIFICATION AND THE BIDDING PROCEDURE

5.1 Introduction

The law on public procurements (1505/1992) and the statute on goods and service procurement and construction contracts that exceed a threshold value (380/1998) are applied to procurements made by Finnra. One of the objectives of the procurement procedure is to utilise the existing competition possibilities in order to find the best possible service provider for the client.

In submitting the project to bidding a negotiated procedure will be used, which begins with a prequalification phase. The client will select no more than five service providers from the candidates that signed up during the prequalification phase, who will participate in the bidding contest. The objective is that the selected procurement procedure supports the development of innovative and cost-efficient implementation methods.

has been published in the Public Procurement Gazette, issue 11/2004, and the Official Journal of the European Union (OJEU), issue S47/2004.

The Client reserves the right not to initiate a bidding contest after the prequalification phase.

5.2 Registering as a candidate and registration deadline

Companies interested in the project are requested to submit their application for participation to Finnra in writing and in CD-ROM format in three copies to the address below:

Finnra, E18 Muurla - Lohjanharju project
Yliopistonkatu 34
20100 Turku

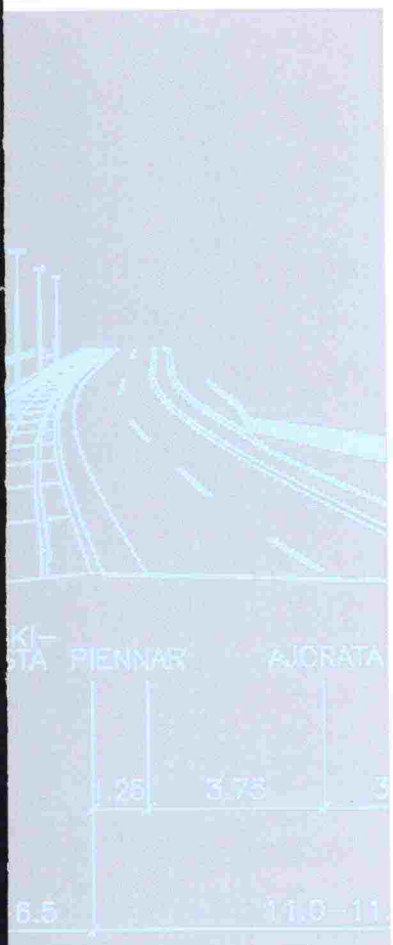
All reports requested in the procurement announcement and Appendix 1 shall be attached to the application for participation.

The registration time for the prequalification ends on **Friday, 30 July 2004 at 12:00 noon** Finnish time. Entries received after the deadline will not be processed.

The application for participation, together with appendices, shall be drafted in Finnish. Copies of the documents in the original language shall also be submitted for documents translated into Finnish.

5.3 The legal form of the service provider

It is required in the procurement announcement that the legal form of the service provider must be a limited liability company, a state-owned company, or a consortium formed by these two. This requirement of the procurement announcement will be revised so that the service provider or a consortium jointly formed by several service providers shall establish a separate company for this project. The legal form of this new company shall



be a limited liability company. A state-owned company may also be a shareholder in the separate company to be established, provided it has been granted the statutory permits for participating in the new company.

5.4 Financial requirements

The candidate shall submit the reports specified in Appendix 1 in order to prove its financial solvency and funding-related prerequisites.

5.5 Technical and professional requirements

The candidate shall submit the reports specified in Appendix 1 regarding its technical and professional competence in order to prove its ability to assume the responsibility for the planning, construction and maintenance of the motorway section in question in a manner satisfactory to the client for the entire duration of the period of the contract.

The working language of the project will be Finnish. Therefore, foreign candidates must specify how they intend to ensure a sufficient command of the Finnish language during the implementation of the project.

5.6 Principles of selecting candidates

In selecting the candidates to be included in the competition, the client will pay attention to the following features with the following weighting:

· project implementation organisation and the professional competence of the key persons	20 %
· experience of large road projects	20 %
· funding arrangements	20 %
· the financial standing of the candidate	20 %
· experience of wintertime construction and maintenance	10 %
· experience of tunnel construction	10 %
Total	100 %

The client may exclude from the procurement procedure a candidate or party that cannot be regarded as a party possessing the technical, economical or other prerequisites for implementing the project or who has neglected the payment of taxes or statutory social security expenses (including pension payments).

5.7 Preliminary schedule for the offer procedure

6.3.2004	Procurement announcement in the Official Journal of the European Union, issue S47/2004
11.3.2004	Procurement announcement in the Public Procurement Gazette, issue 11/2004
26.3.2004	Briefing on the project in the premises of the Ministry of Transportation and Communications (the Infra Hall) at Eteläesplanadi 16, Helsinki
4-5/2004	Briefings on the project are also arranged outside Finland
30.7.2004	**at 12:00 noon**: deadline for the submission of the participation application
30.9.2004	Estimated time of sending the documents of invitation to offer

10-12/2004	Dialogue with the candidates; additional correspondence
3/2005	Delivery of offers
4-6/2005	The client reviews the offers; the bidders present their offers; the 2-3 best offers are selected for the final phase
7-9/2005	Negotiations with the candidates selected for the final phase
10/2005	Procurement decision
10-11/2005	Contract negotiations and signing the contract

5.8 Bidding procedure

On the basis of the applications for participation, the client will select five bidders to participate in the bidding contest, using the evaluation criteria defined above under Item 5.6. The selected bidders will receive documents related to the invitation to tender, including detailed information on the technical prerequisites of the projects, service descriptions and selection criteria for the offers, etc. During the calculation period the client will engage in dialogue with the bidders and, as and when necessary, maintain additional correspondence with the candidates.

On the basis of the first offers, the client will select 2-3 bidders to enter the next phase, after which more specific negotiations will be carried out with the bidders. On the basis of these negotiations, the client will request the best and final offer, on the basis of which the service provider will be selected.

5.9 Quotation fee

Candidates participating in the prequalification are responsible for expenses resulting from the application for participation and preparation of a bid. Parties who have been accepted to enter the bidding contest and those who have submitted an acceptable offer will be paid a quotation fee, the amount of which will be stated no later than in the letter of invitation to tender.

5.10 Electronic communication of information

The application for participation, complete with appendices, shall be submitted in writing and as a CD-ROM file, as specified under Item 5.2. The client and candidates may use electronic communication to contact each other.

The parties shall be responsible for protecting their own systems and interests in electronic communication.

5.11 Enquiries

It is requested that enquiries concerning the project be directed, primarily in writing, to the address mentioned above under Item 5.2, or via e-mail to matti.vehvilainen@tiehallinto.fi. Further information can be obtained by phone from Mr. Matti Vehviläinen, Project Manager, tel. +358-(0)204 22 4651.

A separate web page for the project has been built on Finnra's Internet pages at www.tiehallinto.fi/e18.

6 APPENDICES

Appendix 1:
A CD-ROM disc including
- these instructions for participants in the prequalification
- thematic maps of the project (scale 1:4000)
- an animated demo of the project

Appendix 2:
List of information to be enclosed with the application for participation

Appendix 3:
Maps concerning the project

APPENDIX 1:

A CD-ROM disc including
- these instructions for participants in the prequalification
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APPENDIX 2: INFORMATION TO BE ATTACHED TO THE APPLICATION FOR PARTICIPATION

Items 1-10 below specify in detail the information, reports and certificates that the candidate must attach to its application for participation. A preliminary list of the required documents has been issued in the procurement announcement published in the Public Procurement Gazette, issue 11/2004, and the Official Journal of the European Union (OJEU), issue S47/2004.

The candidates are required to submit the requested information in a separate presentation folder in the order specified below, following the specified numbering. The candidates are requested to submit three copies of the folder, as well as three CD-ROM discs. The information should be presented in Finnish. Copies of the documents in the original language shall also be submitted for documents translated into Finnish.

The client will use the submitted information in the preliminary selection of service providers.

A separate company shall be established for this project. If the founder of the separate company is a consortium formed by several parties, the information, reports and certificates listed below must be submitted separately for each party.

1. General information on the candidate

The candidate is required to submit the following information and statements:

1. a description of the company's operations and contact information
2. extract of the trade register, or a corresponding document issued by an authority, proving that the association is registered
3. separate clarification of the legal signatures, unless the right to use the signature is specified in the extract of the trade register
4. preliminary memoranda of association for the separate company
5. division of tasks and responsibilities between the parties
6. long-term commitment of the parties
7. other issues relevant to the arrangements for the separate company

2. Report on fulfilling social obligations

The client wants to be sure that the candidate has fulfilled its social obligations. To prove this, the candidate shall submit the following certificates:

1. an official attestation issued by an authority in the country of residence that taxes have been paid (in Finland, an attestation of tax liability)
2. an official attestation by an authority in the country of residence that social security fees have been paid (in Finland, this is included in the attestation of tax liability)
3. a certificate of having paid statutory pension fees

3. Report on the candidate's financial status

The candidate is required to submit the following information and statements:

1. the approved and audited financial statements of the candidate company for the last three financial years (income statement and balance sheet with notes, and the annual report)
2. interim reports drafted after the last approved financial reports
3. a statement by a bank or other credit institution on the company's credit standing

4. Preliminary specification on funding arrangements

The candidate is required to submit a preliminary plan on the funding arrangements for the project, specifying, among other things:

1. the structure of funding
2. possible financiers
3. ratio between equity and liabilities
4. other issues relevant to the arrangement

5. References for the candidate

For projects amounting to more than EUR 10 million, the candidate must submit information on its references. With regard to a single reference subject, the information required is the content of the project, the total value of the project, time of delivery and client, with contact information. In the event that the candidate has not been solely responsible for a single target referred to, it shall communicate how large a share and what type of share it has been responsible for. Furthermore, the candidate shall state whether the sites referred to have required competence in wintertime construction and soil frost measuring. With regard to references to winter maintenance, the candidate is required to present sites with a value lower than EUR 10 million.

The candidates are requested to particularly emphasise the following types of references in their application for participation:

- project management
- Public Private Partnership projects (PPP)
- design and construction of major road projects
- design and construction of tunnels
- design and construction of bridges
- service and maintenance of roads

References for subcontractors shall also be presented here, providing they have committed to the project in the prequalification phase.

References for the past ten years are eligible.

6. Competence and skills of the personnel

As proof of the competence and skills of the employees participating in the project, the candidate shall supply

1. a specification on the training and experience of the executive personnel of the company and the project, and other employees assuming an important role in the implementation of the contract
2. corresponding information on subcontractors that have committed to the project
3. for foreign companies, a statement of how they intend to ensure sufficient command of the Finnish language during the implementation of the project

7. Other experts

The candidate is also required to present a report and references of experts in its service that were not introduced under items 5 and 6. These areas of expertise may be, for example

- project management
- financing competence
- road design and construction
- bridge design and construction
- tunnel design and construction
- competence in geotechnology
- road architecture and environmental design
- traffic planning
- service and maintenance of motorways
- quality control

8. Quality assurance

The candidate is required to submit a report on its quality system, audits performed and executive reviews.

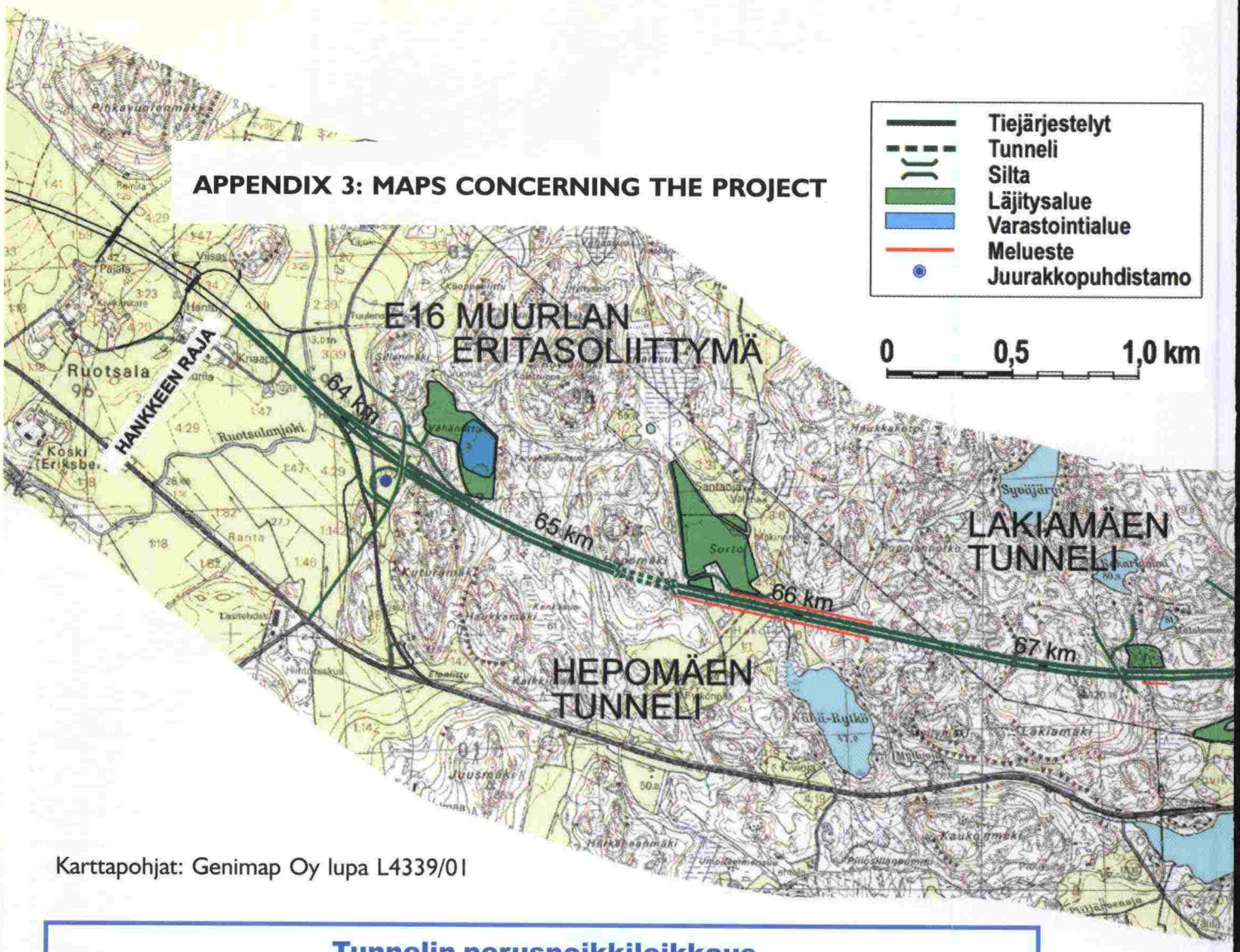
9. Prerequisites for research and development

The candidate is requested to submit information on its ability and possibilities to participate in research and development work in the sector.

10. Use of subcontracting

The candidate is requested to present a description of its subcontracting procedures.

APPENDIX 3: MAPS CONCERNING THE PROJECT



Karttapohjat: Genimap Oy lupa L4339/01

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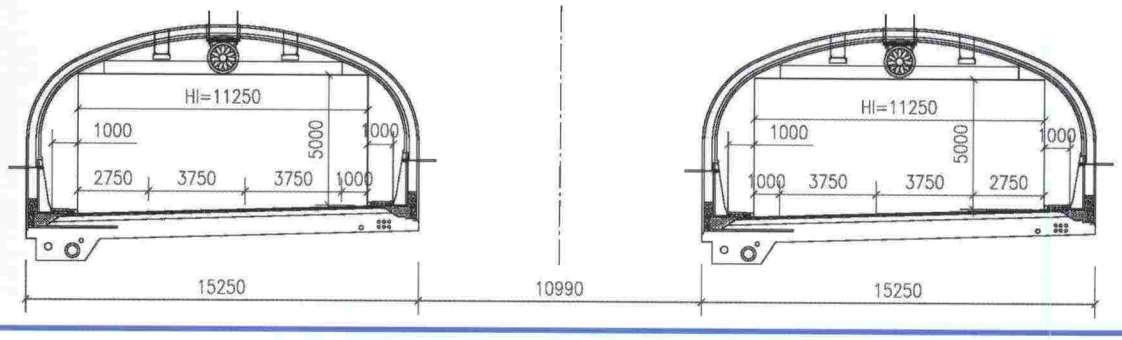

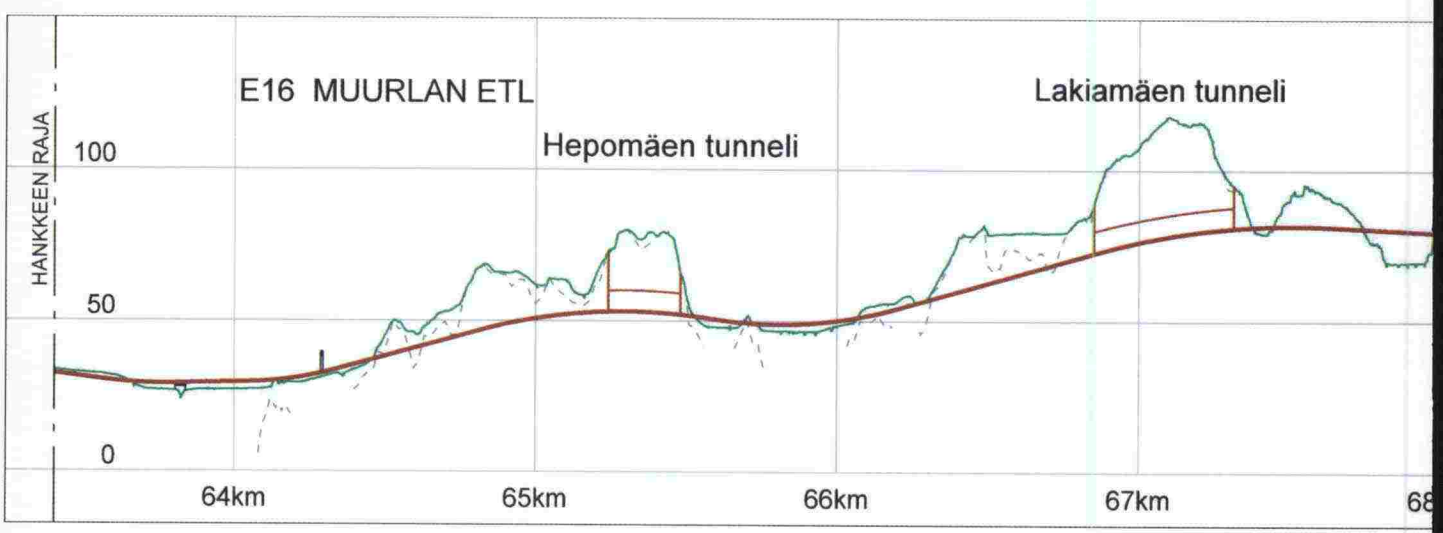

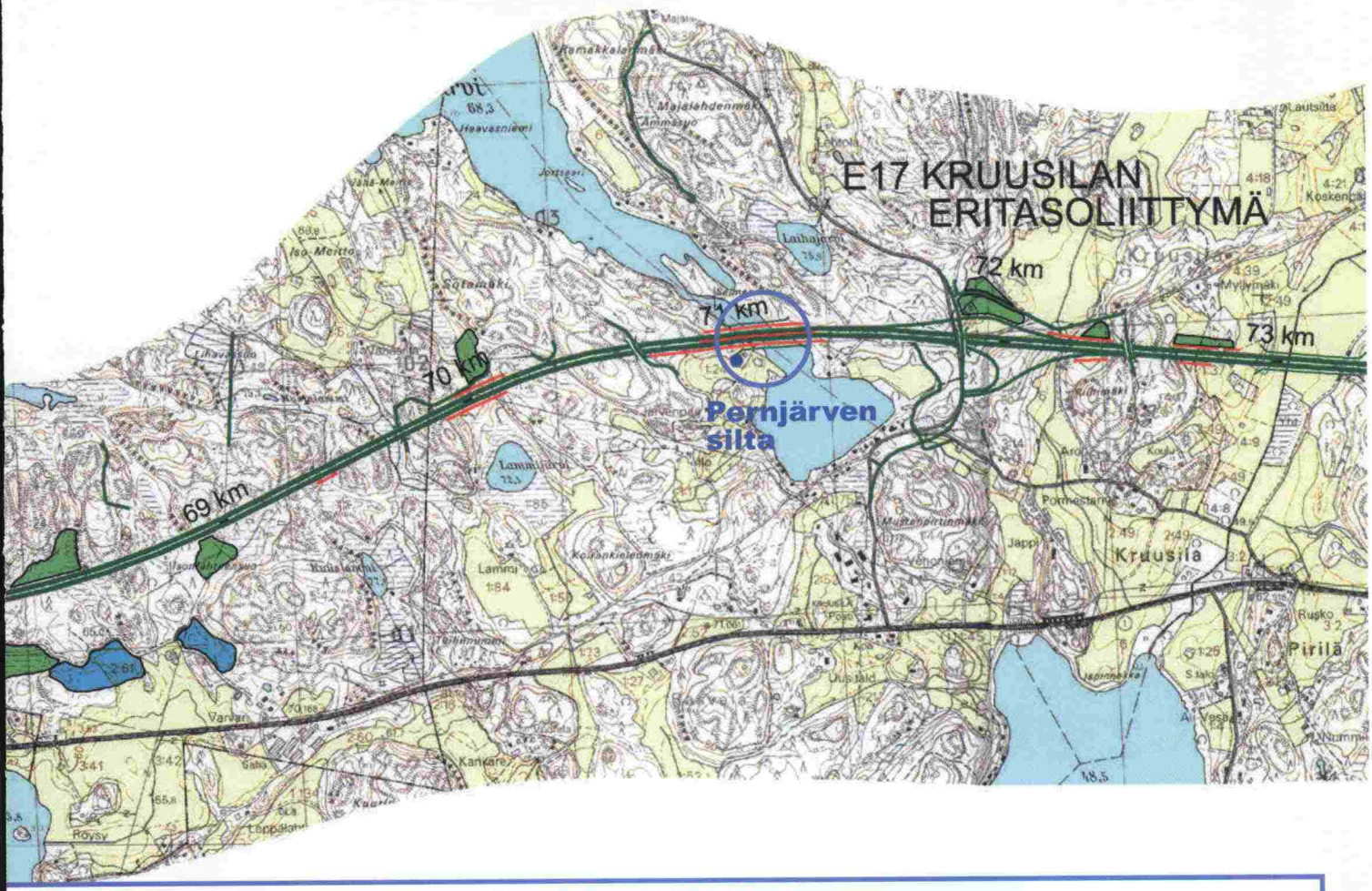

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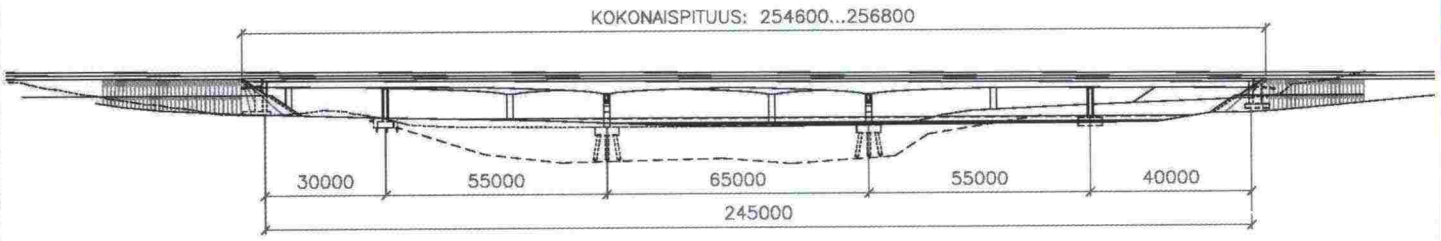

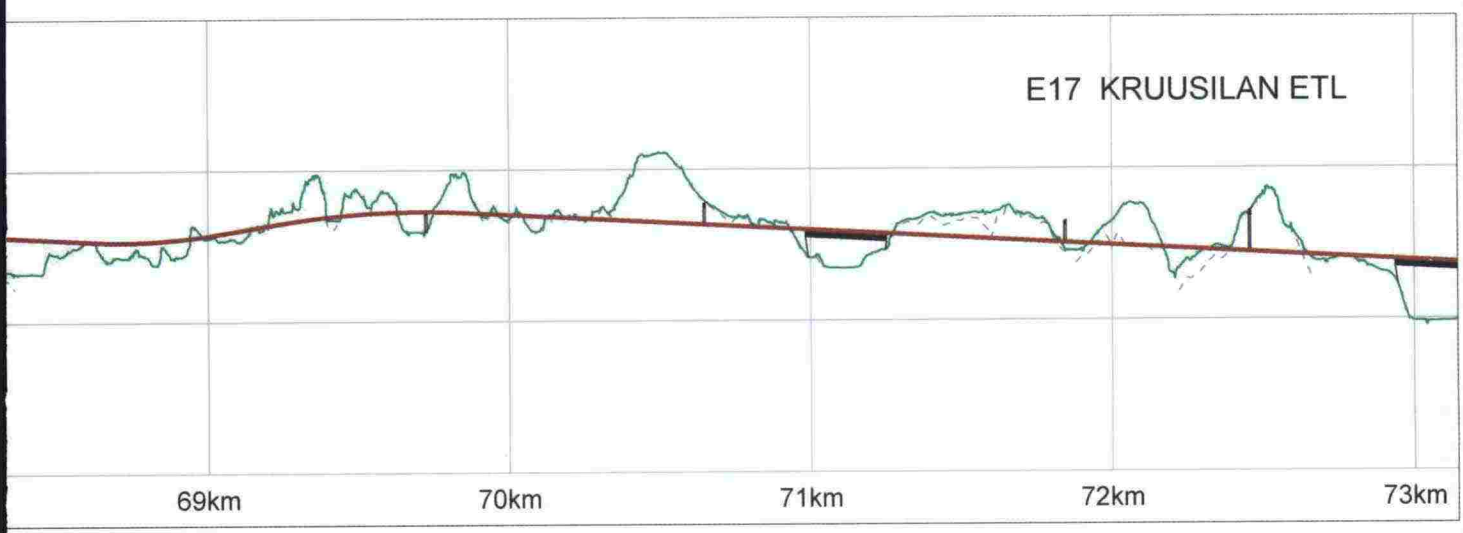

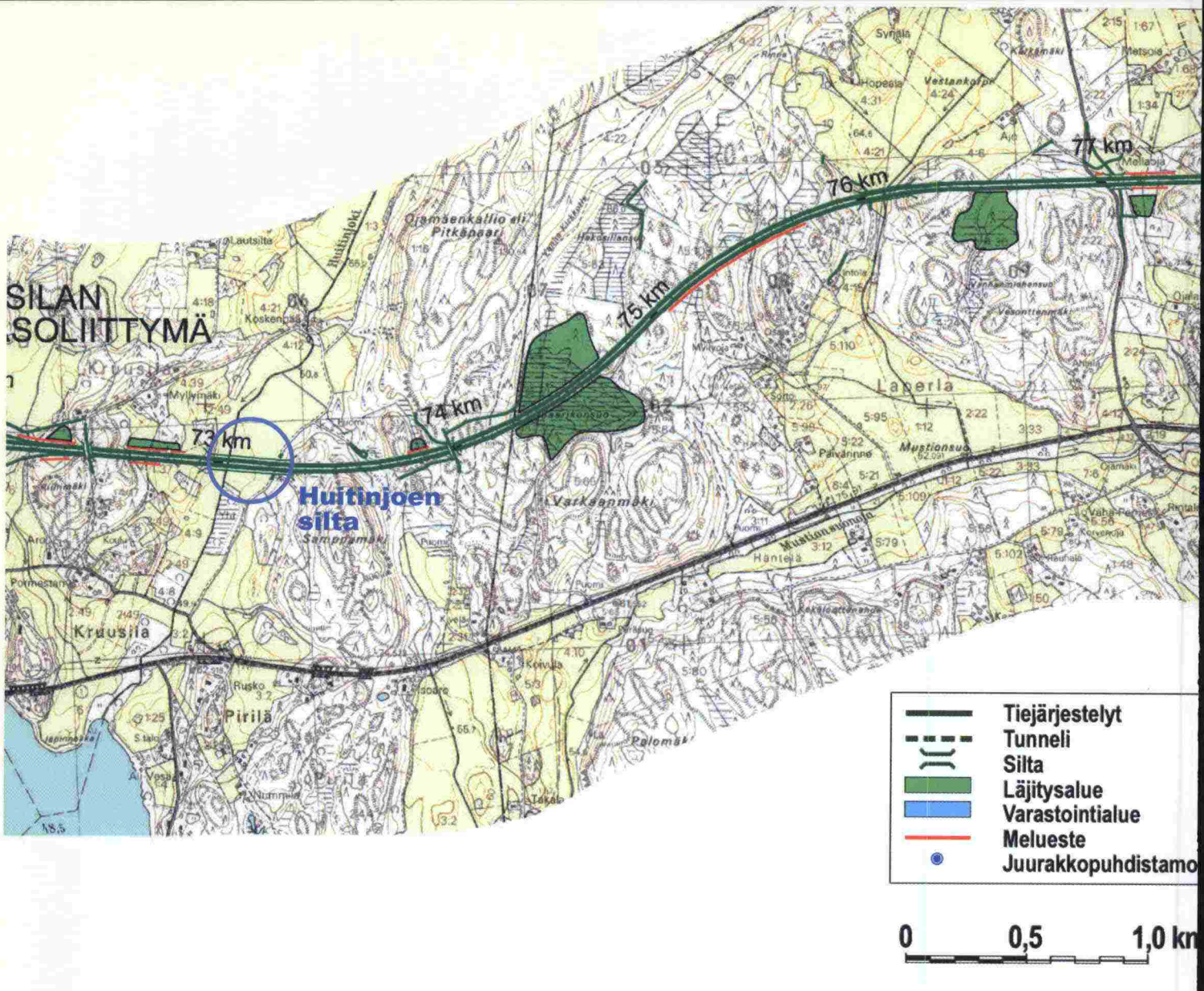

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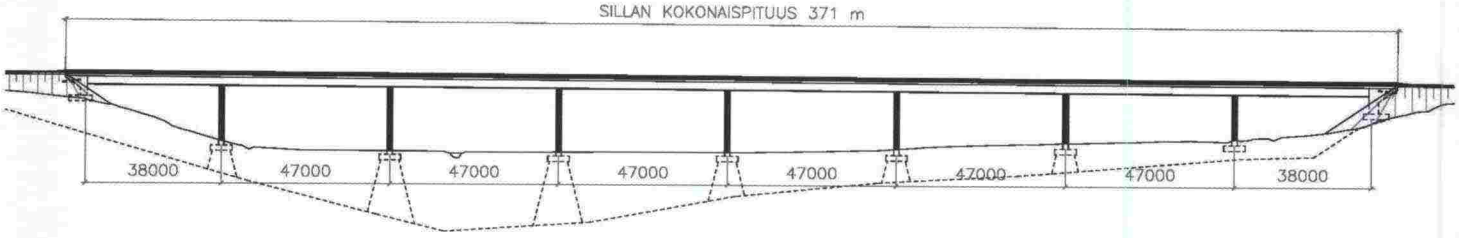

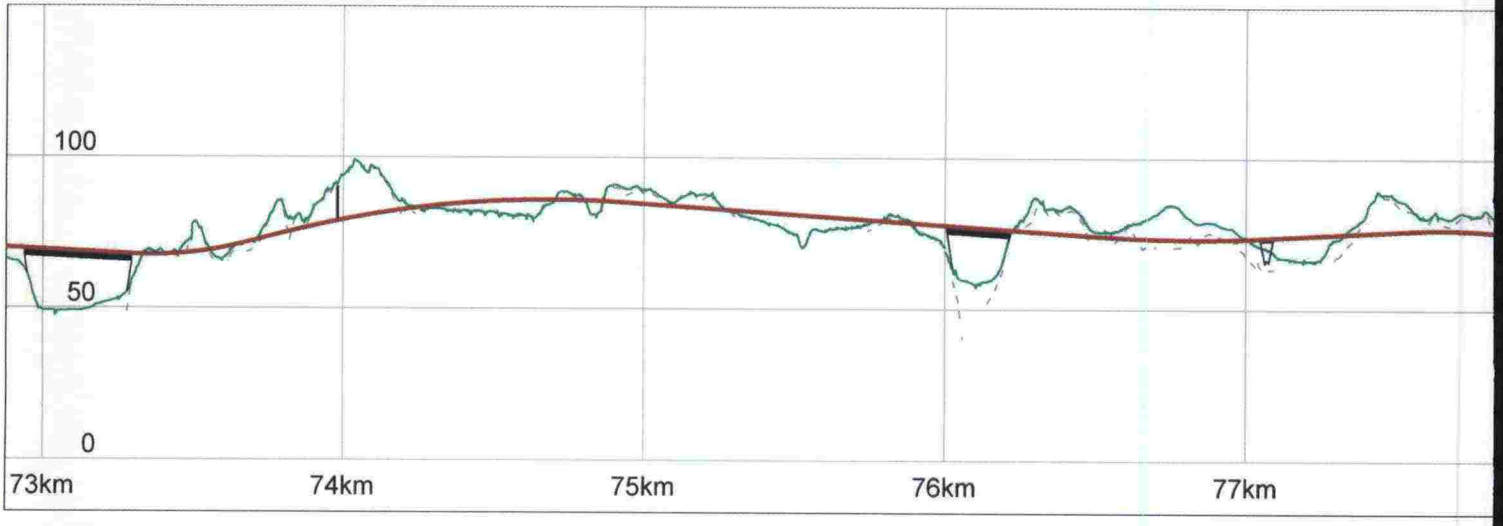

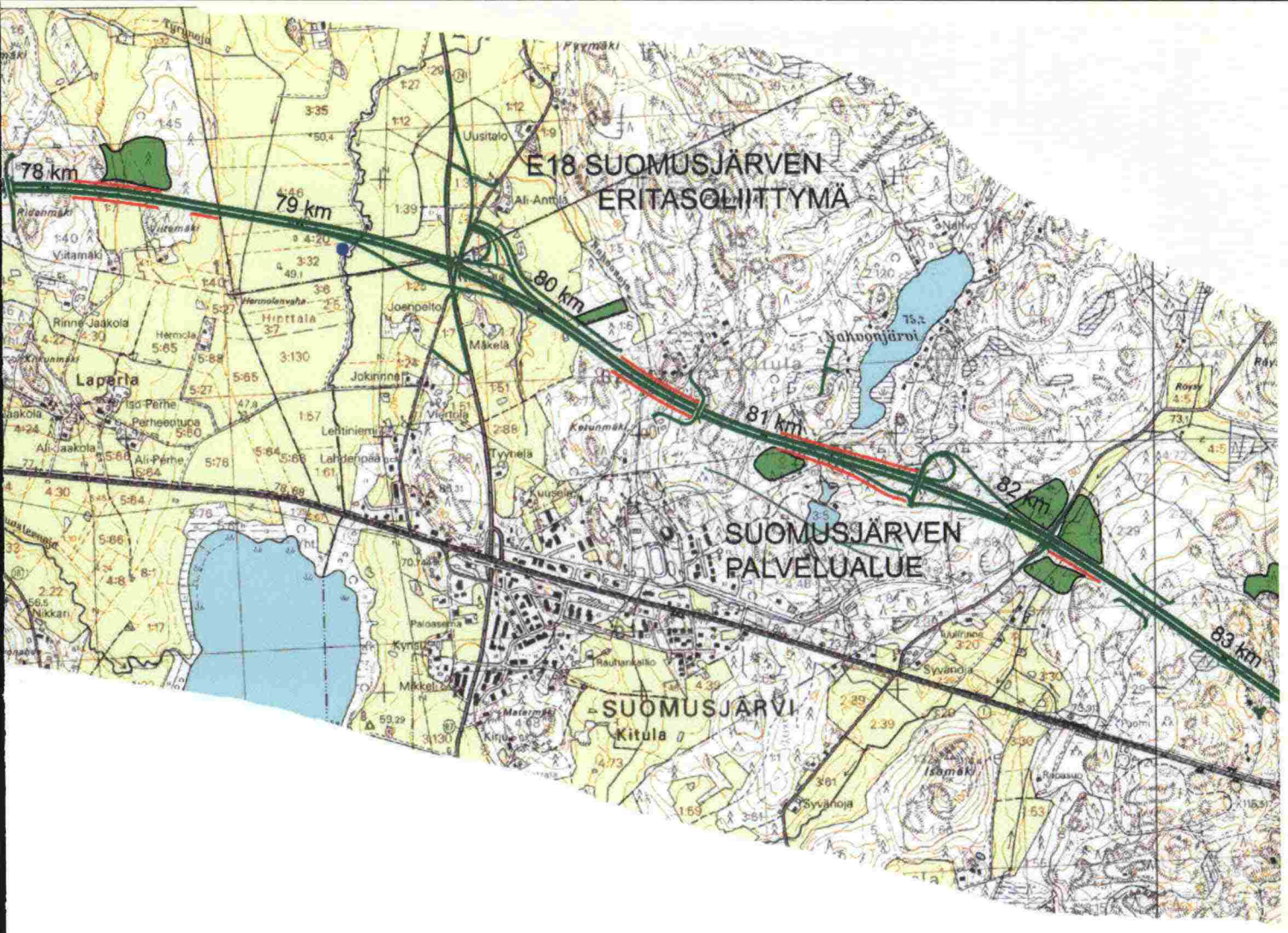

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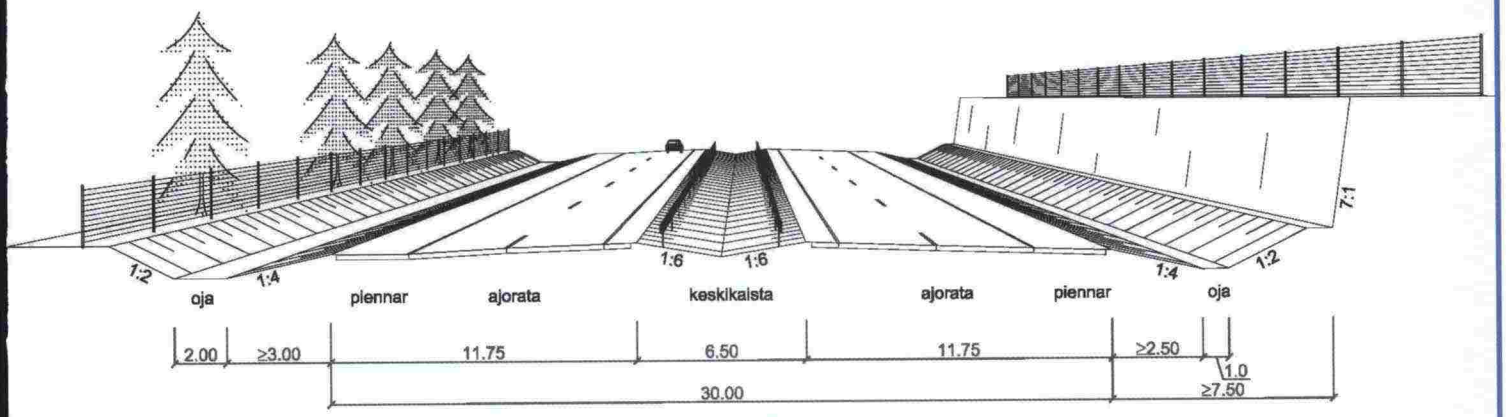

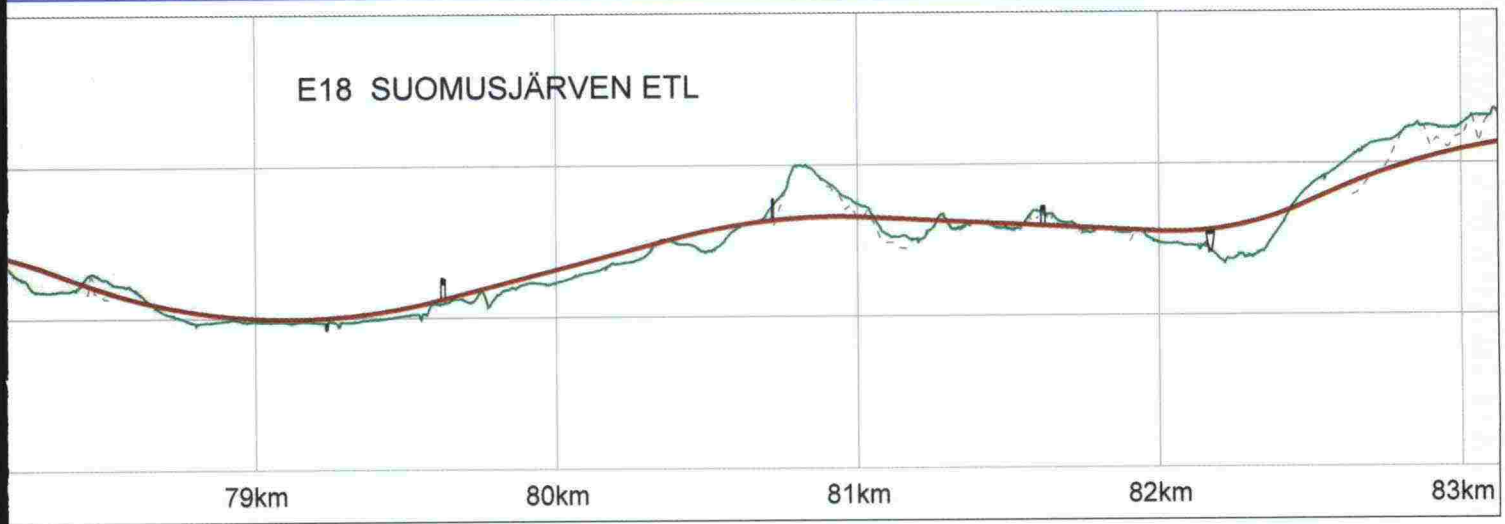

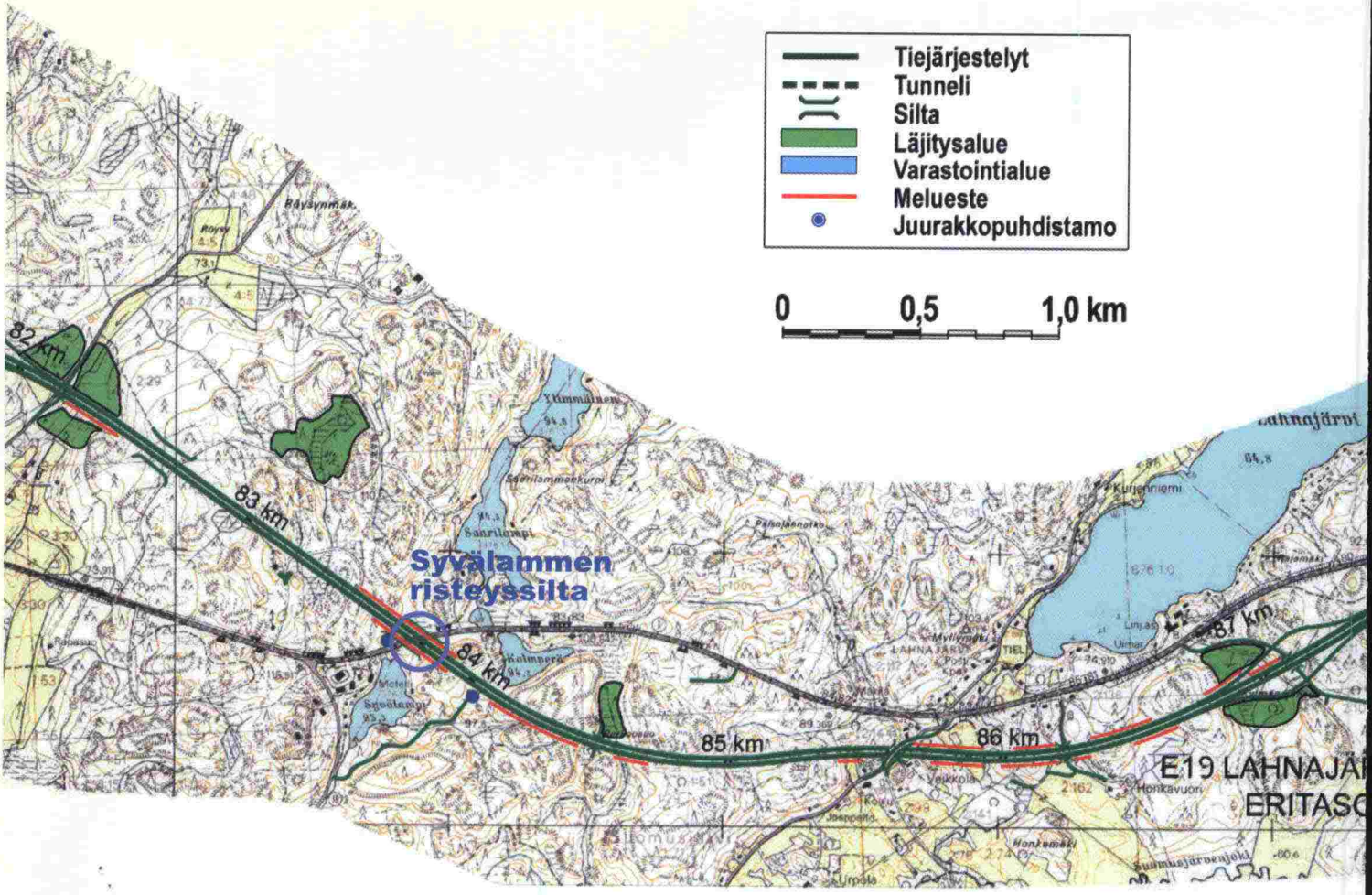

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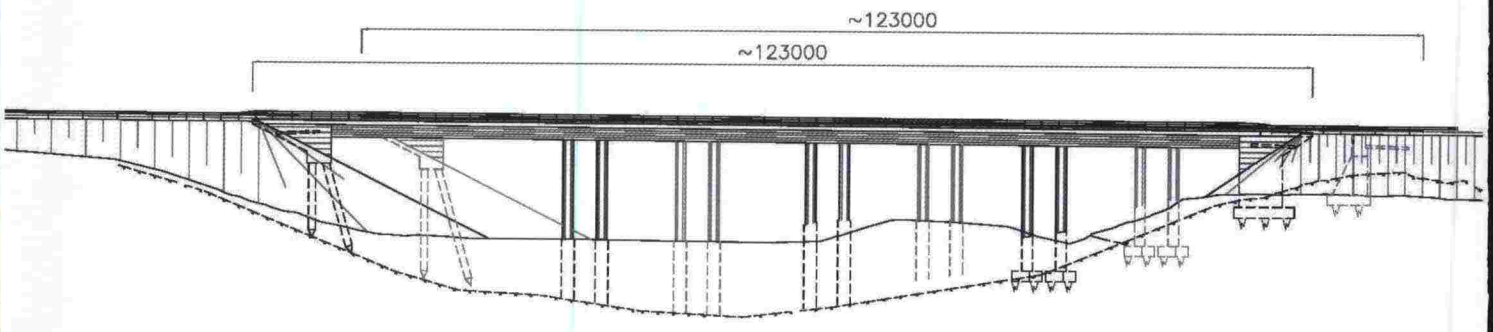

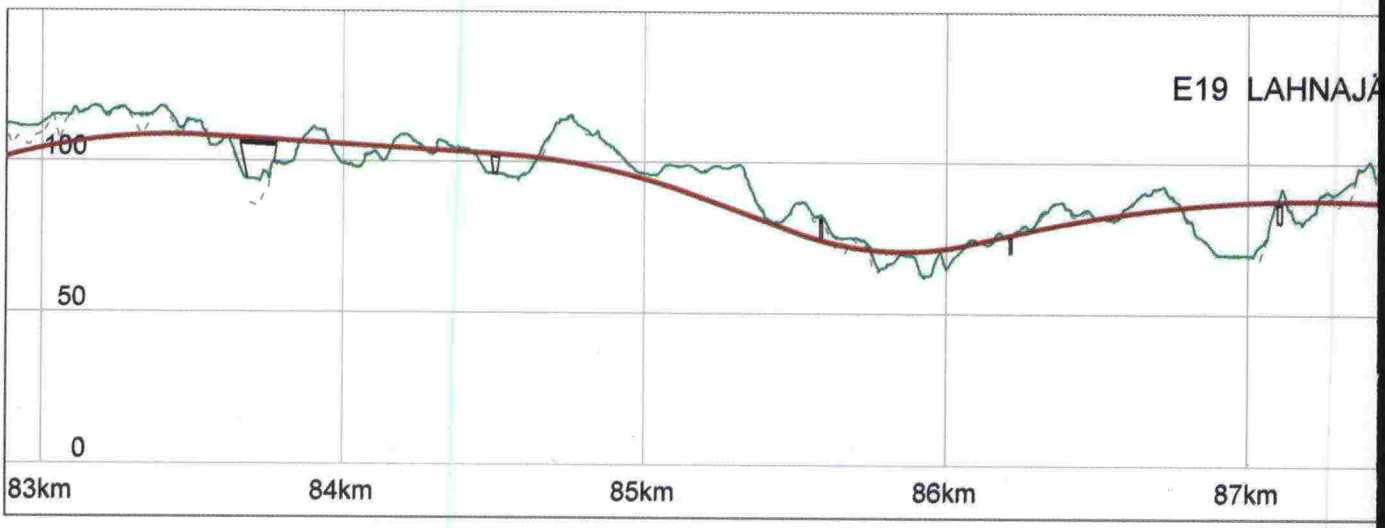

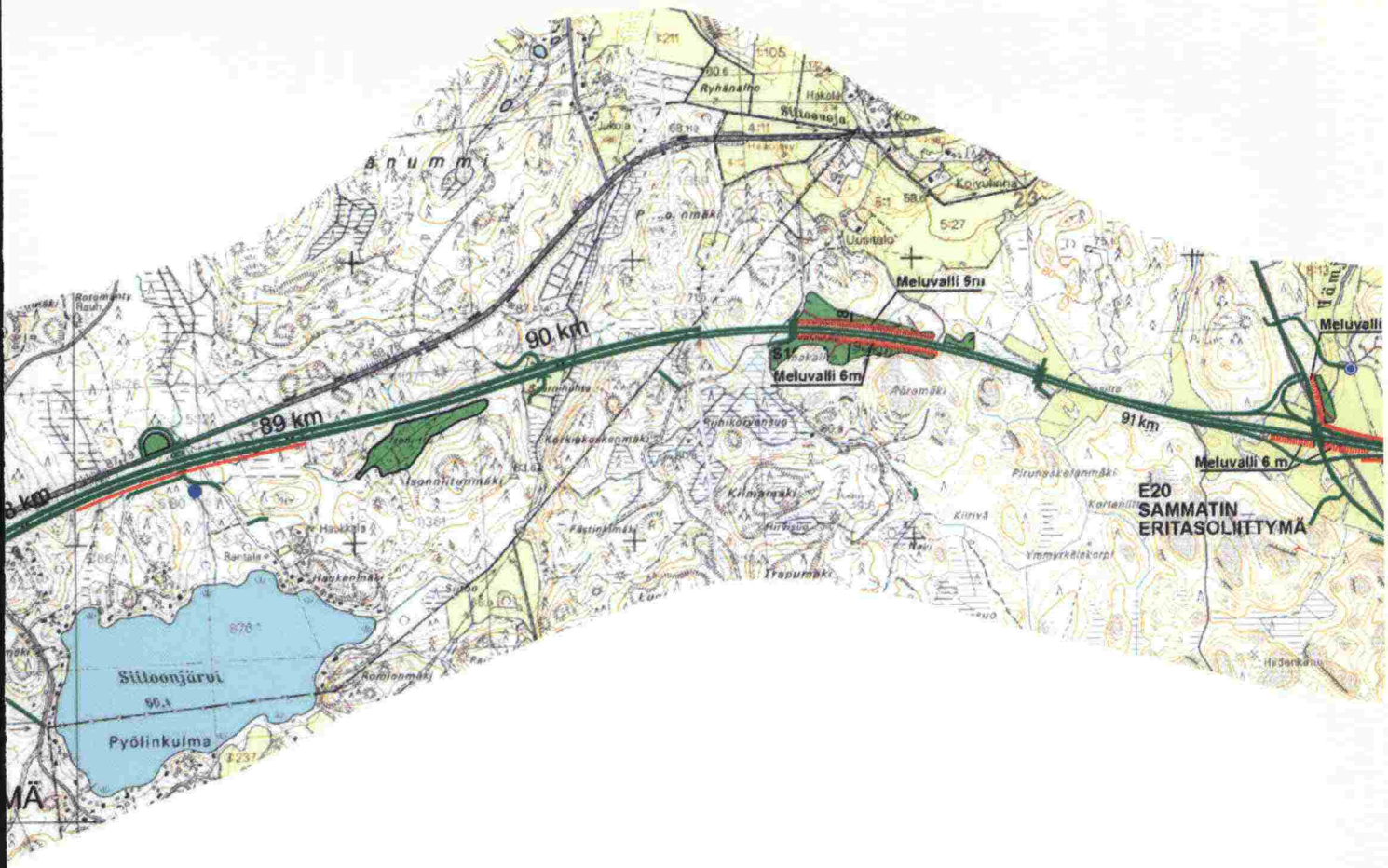

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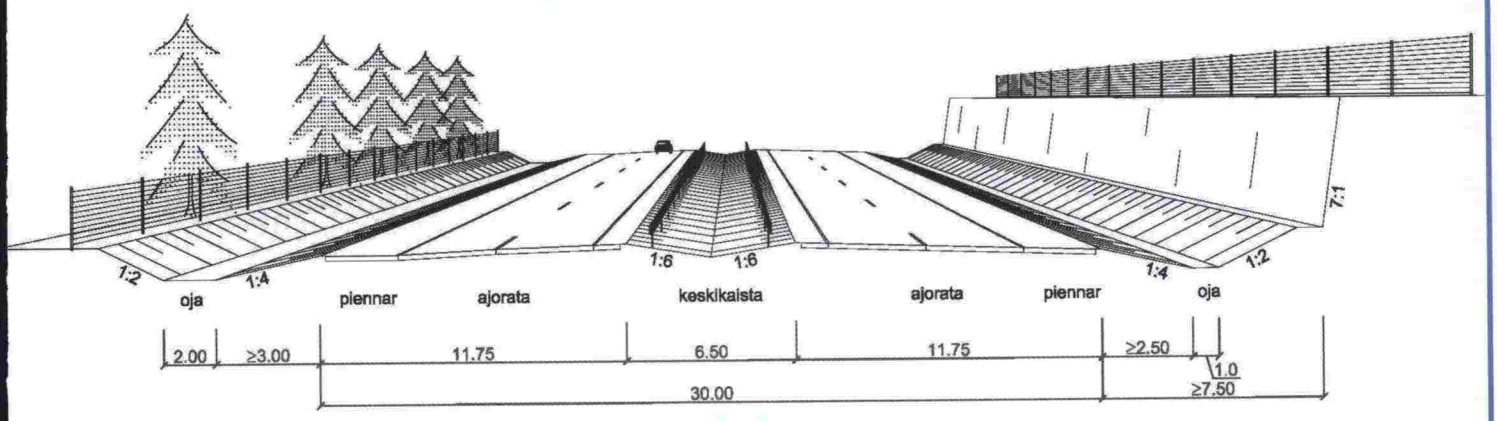

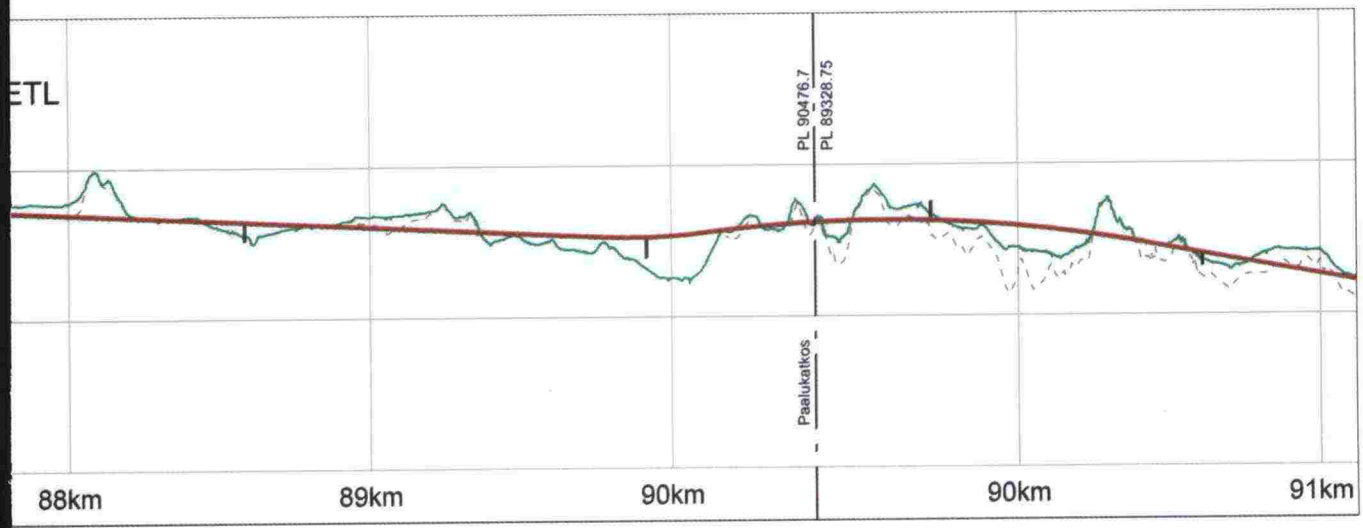

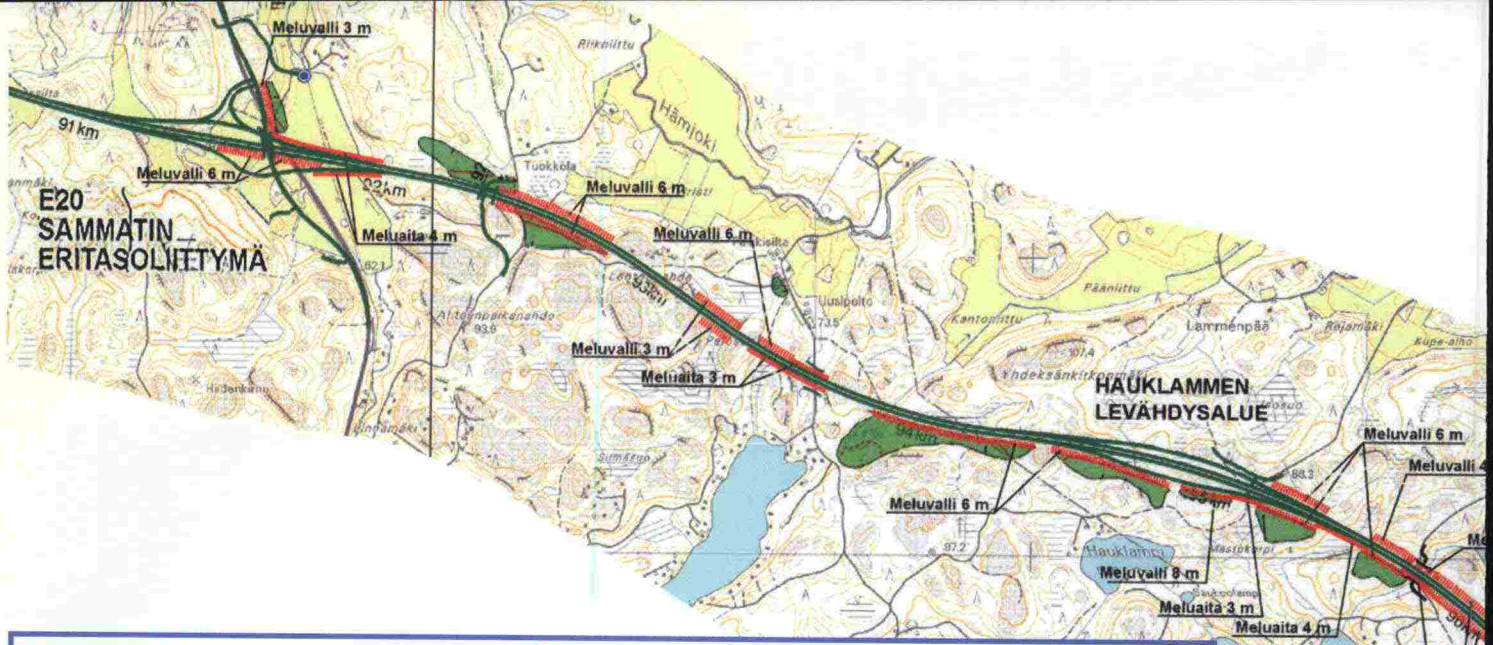

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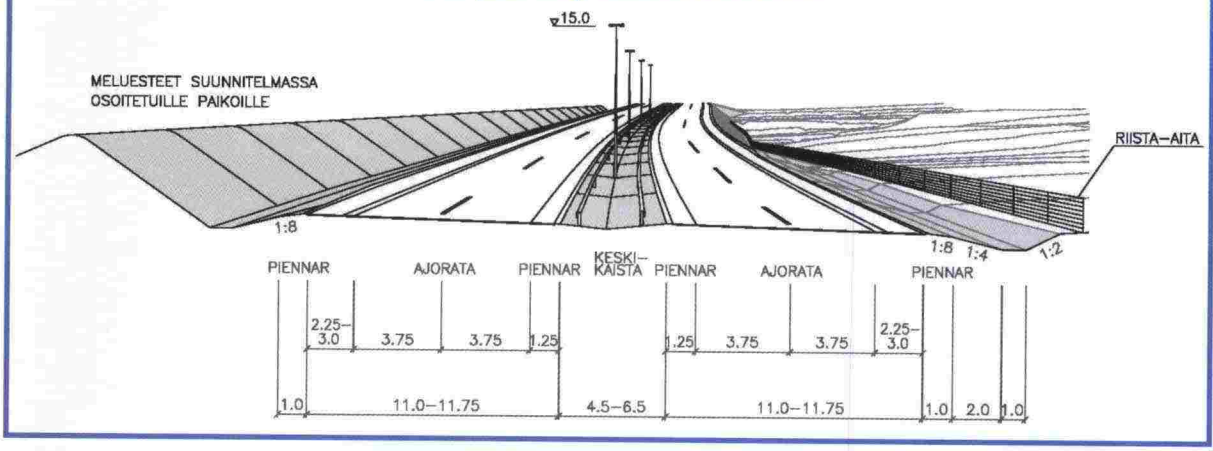

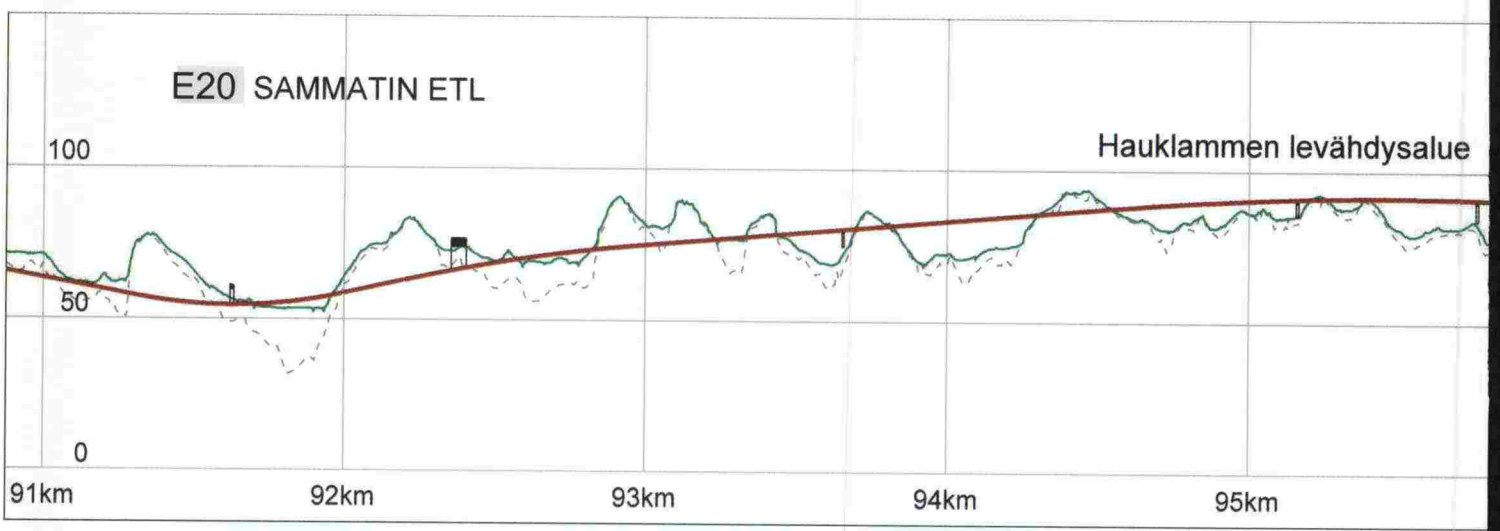

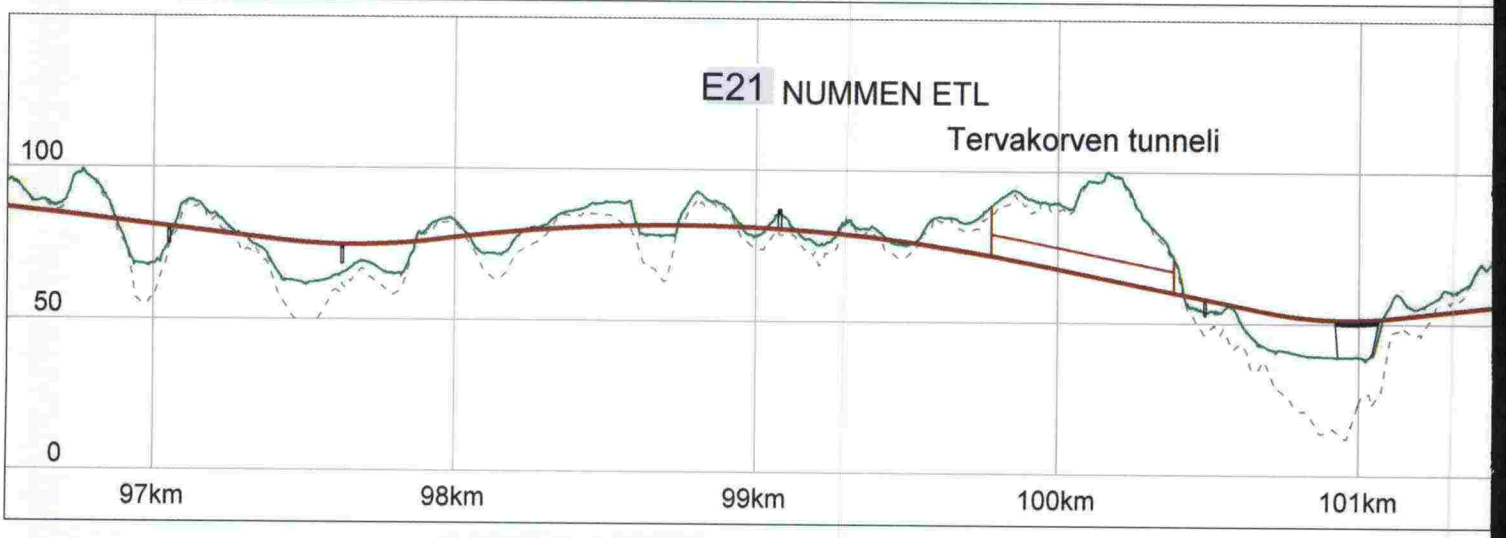

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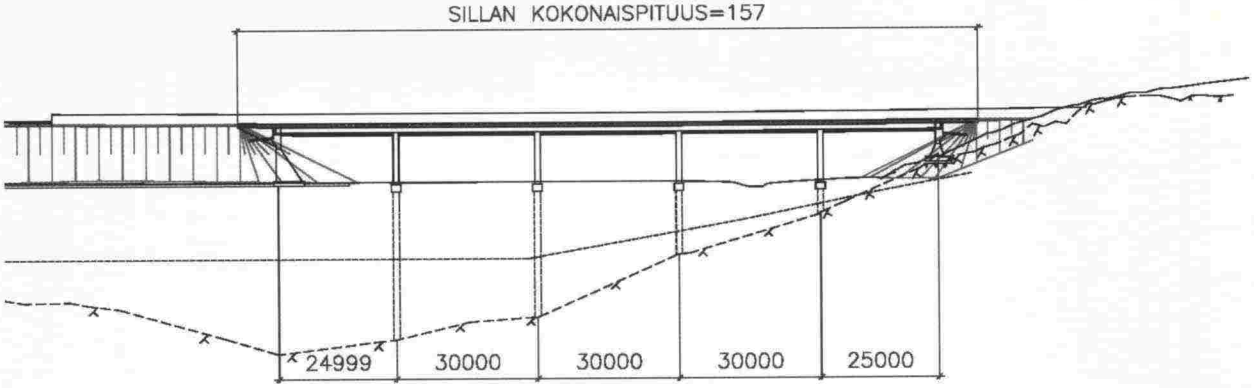

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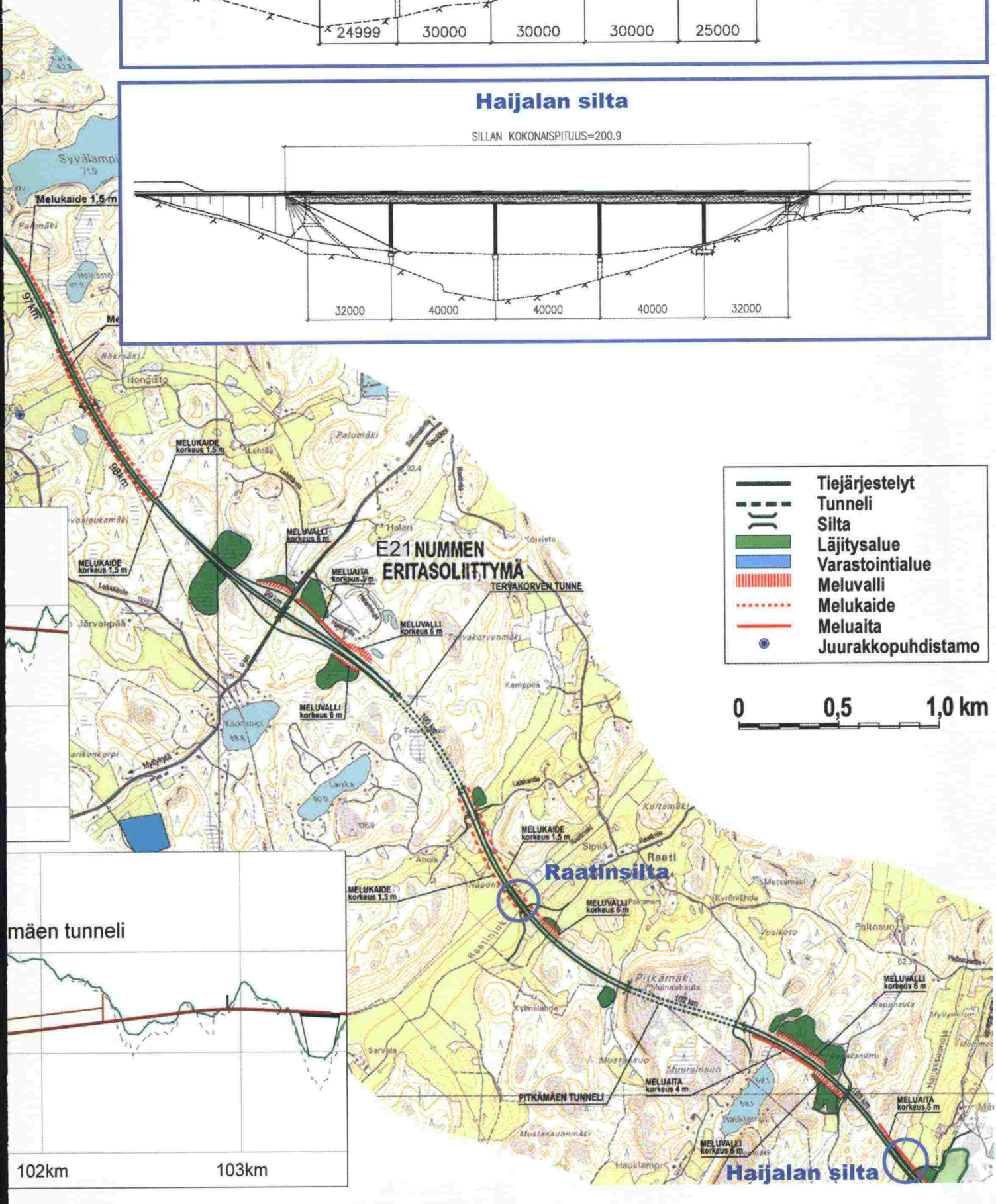

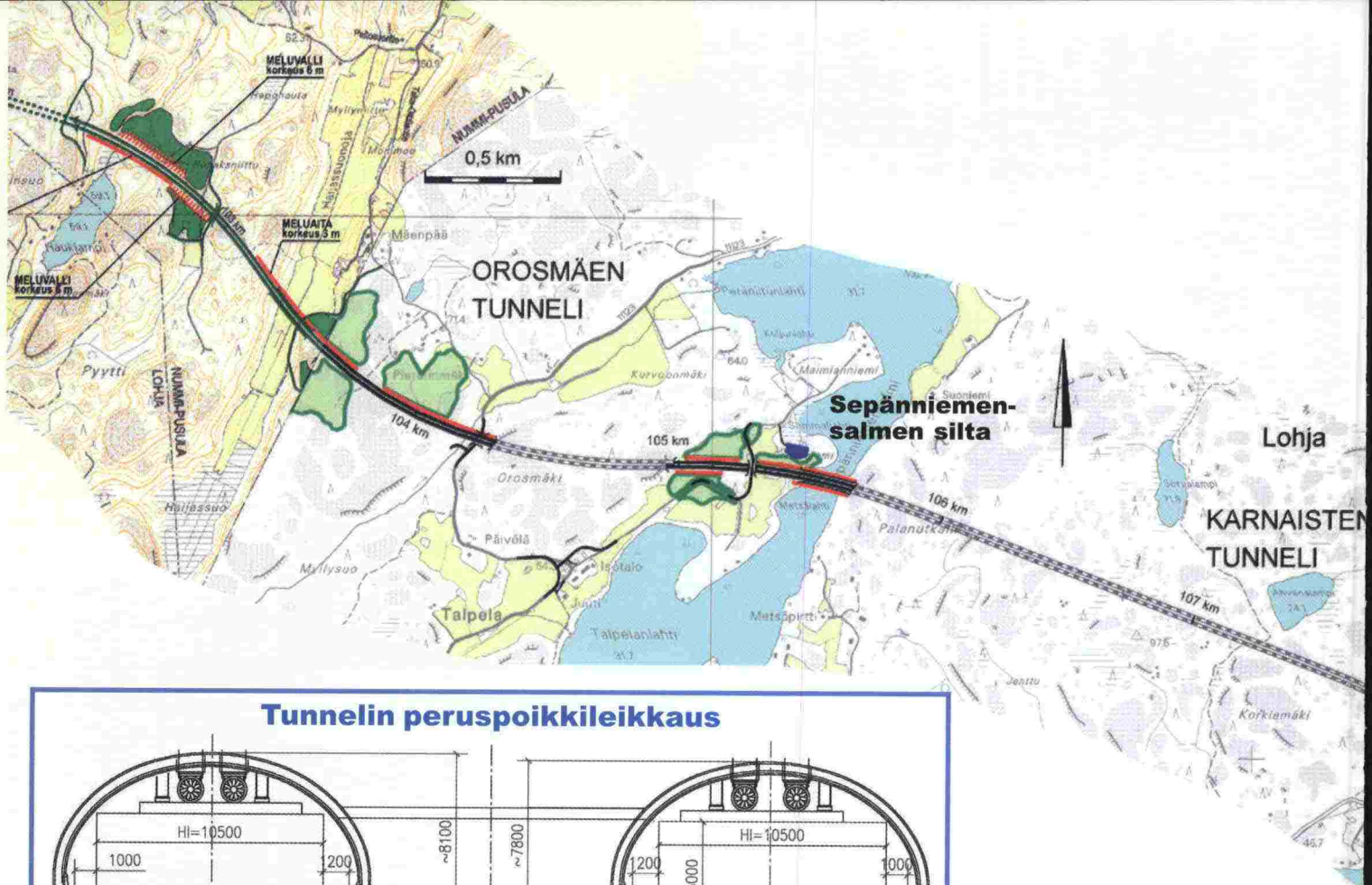

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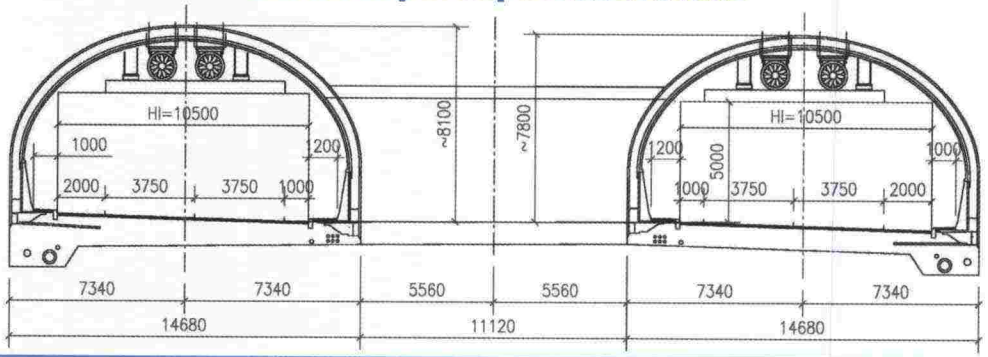

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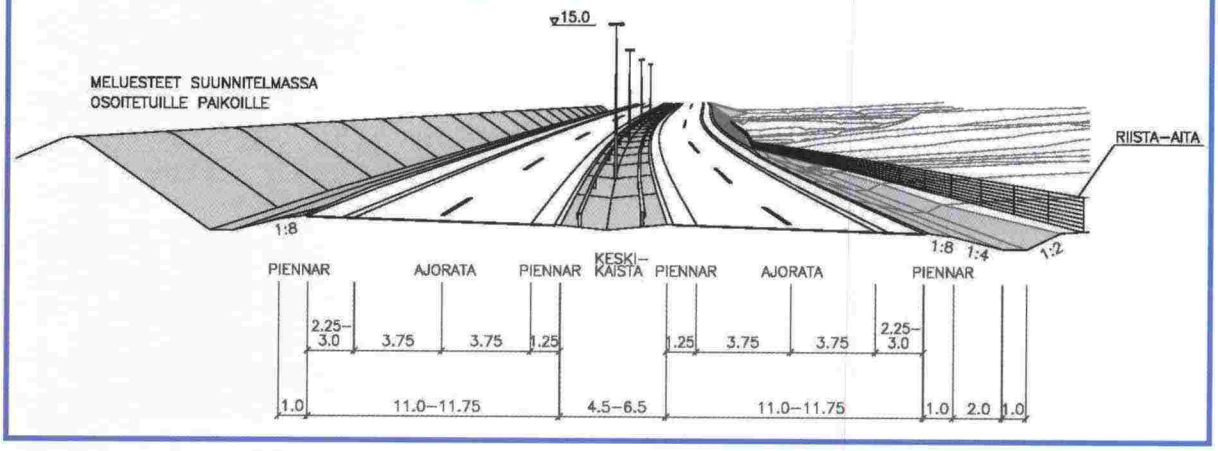

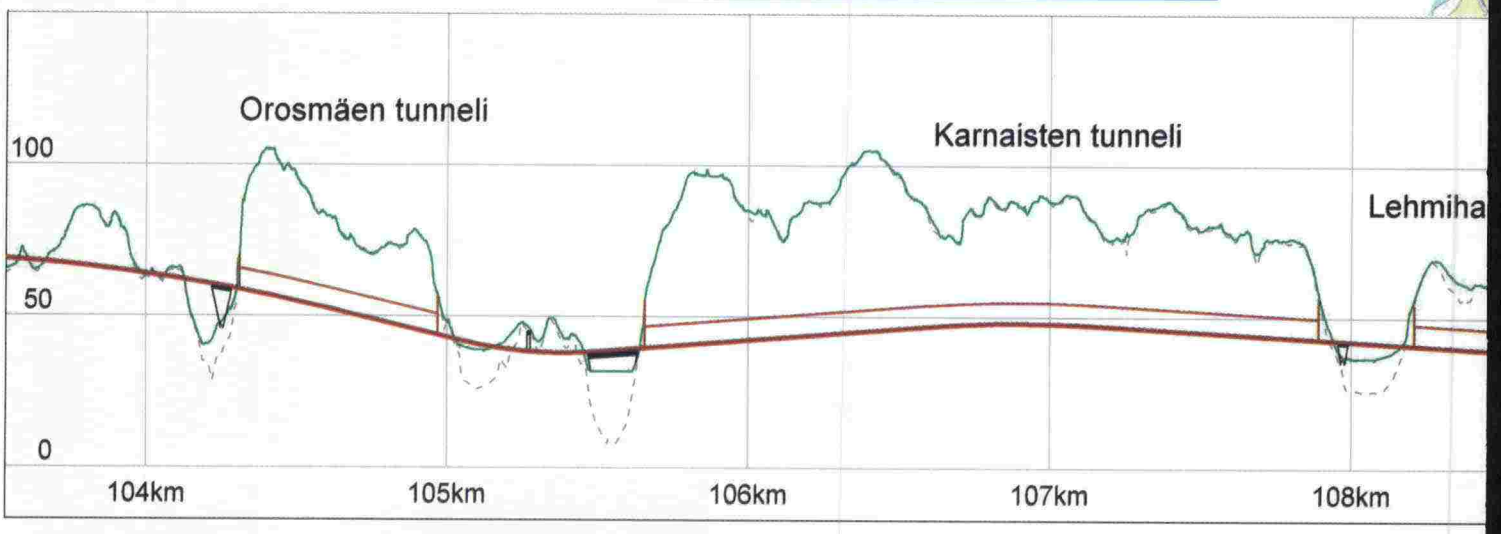

Tiejärjestelyt
Tunneli
Kevytväylä
Melueste
Läjitysalue
Juurakkopuhdistamo

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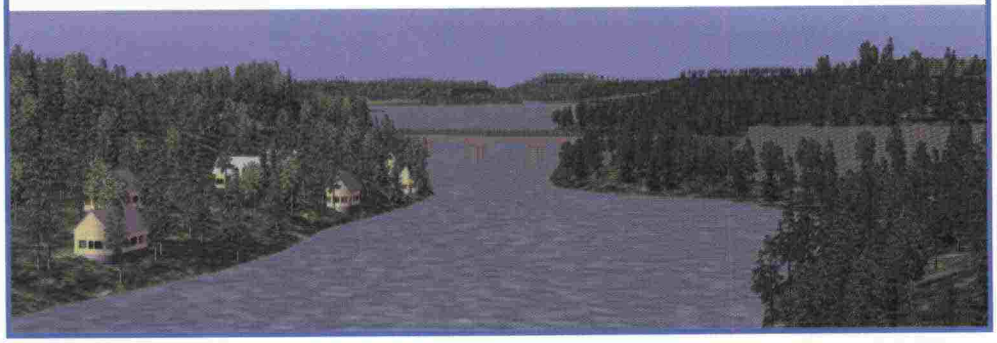

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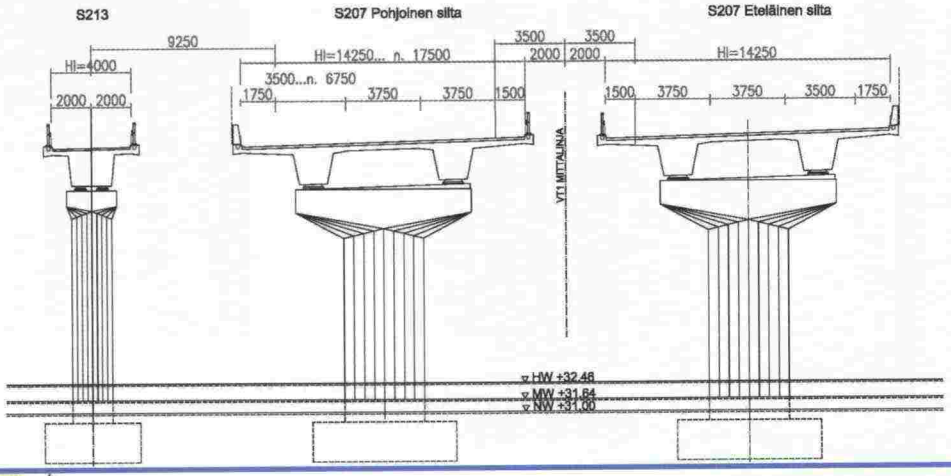

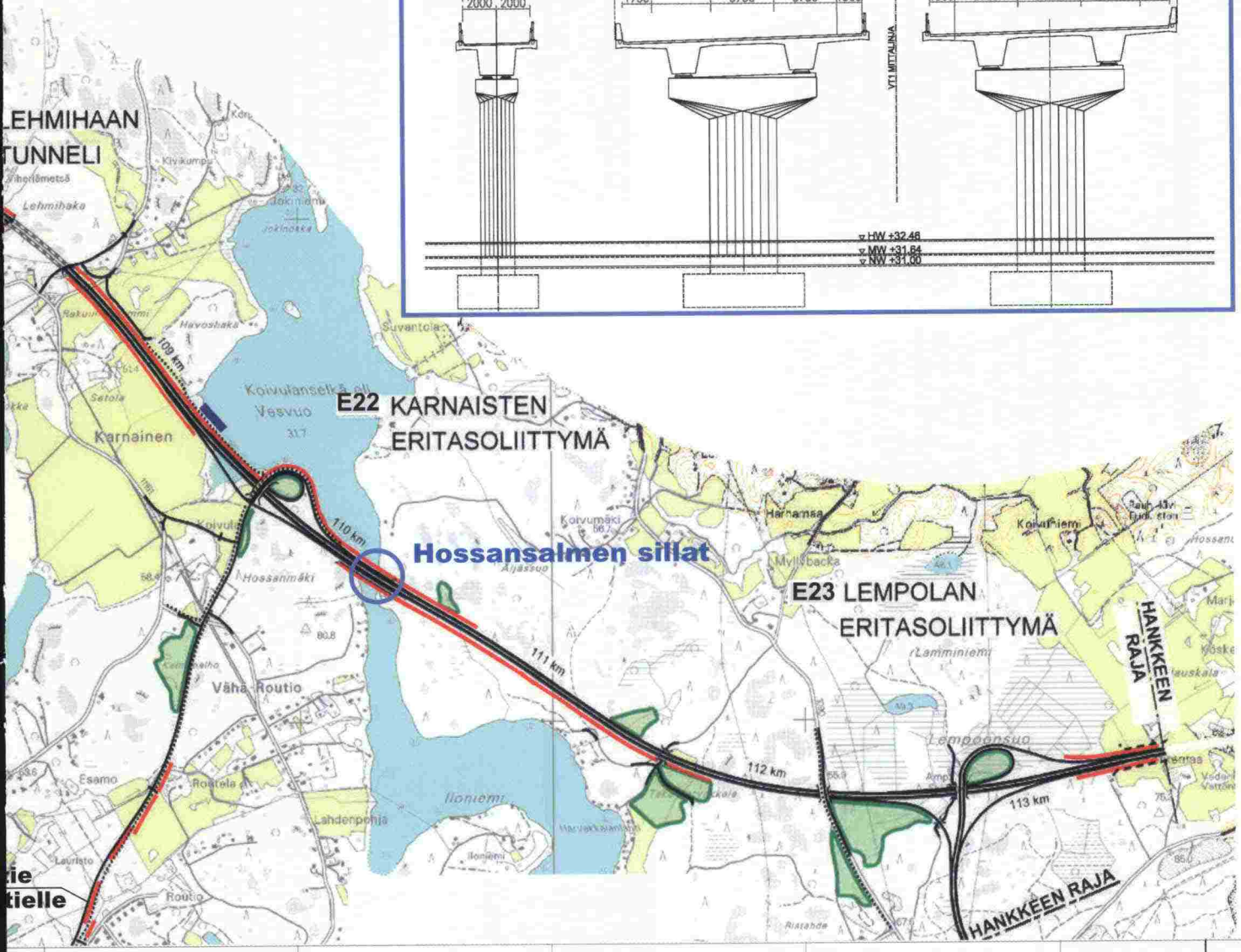

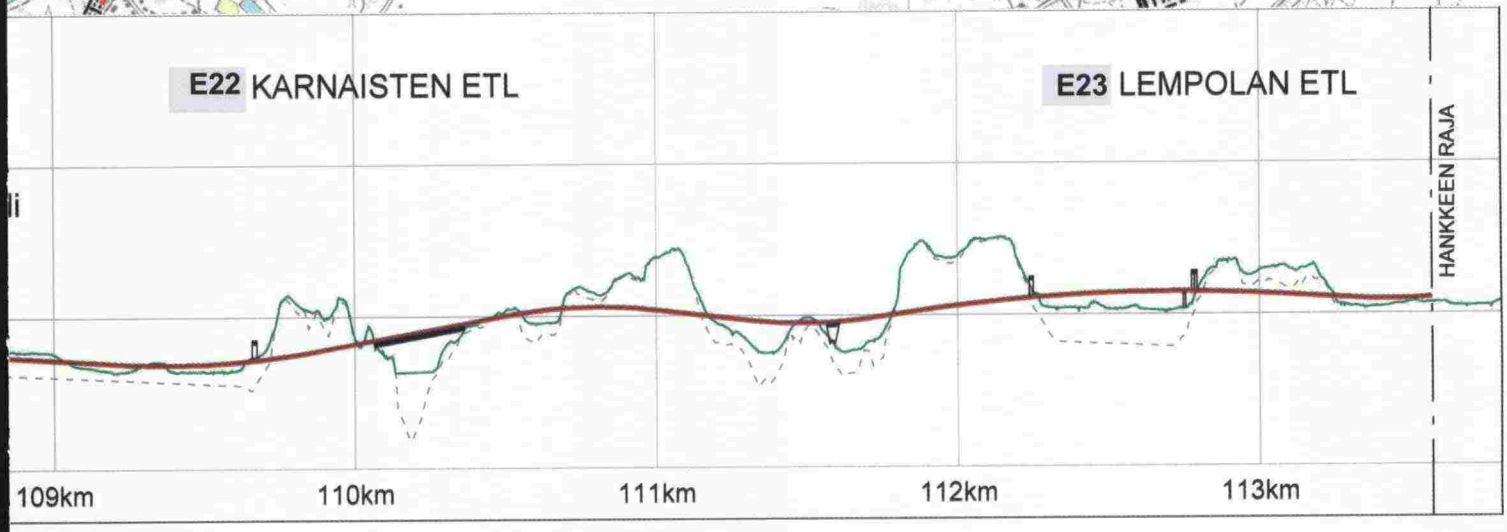

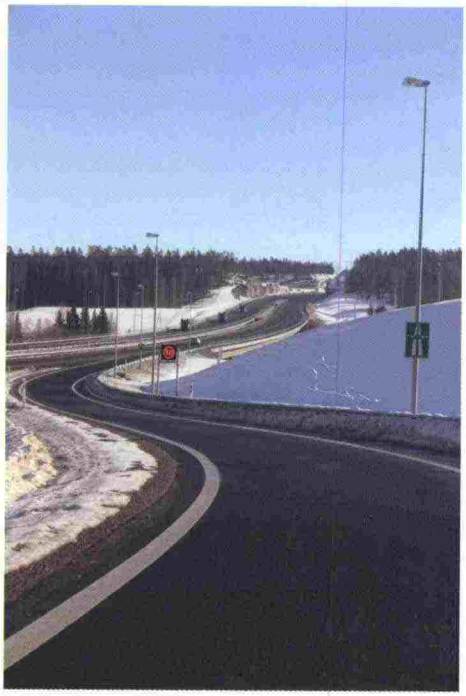

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E18 Muurla - Lohjanharju project

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